OSHA OVERSIGHT: WORKER HEALTH AND SAFETY AT UNION CARBIDE, INSTITUTE, WV, FACILITY

HEARING

BEFORE THE

SUBCOMMITTEE ON HEALTH AND SAFETY

OF THE

COMMITTEE ON EDUCATION AND LABOR
HOUSE OF REPRESENTATIVES

NINETY-NINTH CONGRESS

FIRST SESSION

HEARING HELD IN WASHINGTON, DC, OCTOBER 2, 1985

Serial No. 99-77

Printed for the use of the Committee on Education and Labor

U.S. GOVERNMENT PRINTING OFFICE
57-846 O WASHINGTON : 1986

H341-56

COMMITTEE ON EDUCATION AND LABOR

AUGUSTUS F. HAWKINS, California, *Chairman*

WILLIAM D. FORD, Michigan
JOSEPH M. GAYDOS, Pennsylvania
WILLIAM (BILL) CLAY, Missouri
MARIO BIAGGI, New York
AUSTIN J. MURPHY, Pennsylvania
DALE E. KILDEE, Michigan
PAT WILLIAMS, Montana
MATTHEW G. MARTINEZ, California
MAJOR R. OWENS, New York
RICK BOUCHER, Virginia
CHARLES A. HAYES, Illinois
CARL C. PERKINS, Kentucky
TERRY L. BRUCE, Illinois
STEPHEN J. SOLARZ, New York
MERVYN M. DYMALLY, California
DENNIS E. ECKART, Ohio
TIMOTHY J. PENNY, Minnesota
CHESTER G. ATKINS, Massachusetts

JAMES M. JEFFORDS, Vermont
WILLIAM F. GOODLING, Pennsylvania
E. THOMAS COLEMAN, Missouri
THOMAS E. PETRI, Wisconsin
MARGE ROUKEMA, New Jersey
STEVE GUNDERSON, Wisconsin
STEVE BARTLETT, Texas
ROD CHANDLER, Washington
THOMAS J. TAUKE, Iowa
JOHN R. McKERNAN, Jr., Maine
RICHARD K. ARMEY, Texas
HARRIS W. FAWELL, Illinois
PAUL B. HENRY, Michigan

Subcommittee on Health and Safety

JOSEPH M. GAYDOS, Pennsylvania, *Chairman*

AUSTIN J. MURPHY, Pennsylvania
WILLIAM D. FORD, Michigan
CHARLES A. HAYES, Illinois
AUGUSTUS F. HAWKINS, California
(Ex Officio)

ROD CHANDLER, Washington
MARGE ROUKEMA, New Jersey
JAMES M. JEFFORDS, Vermont
(Ex Officio)

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, DC 20402

CONTENTS

Page

Hearing held in Washington, DC, on October 2, 1985 1

Statement of:

- Browning, Jackson B., vice president, health, safety and environmental affairs, Union Carbide, accompanied by Larry H. DuPuy, assistant plant manager, Institute 54
- DuPuy, Larry, assistant plant manager, Institute plant, Union Carbide 60
- Robinson, George, director, health and safety department, International Association of Machinists and Aerospace Workers, accompanied by Joseph Gresham, business representative, Local Lodge 656, Institute 46
- Tyson, Patrick R., Acting Assistant Secretary of Labor for Occupational Safety and Health, accompanied by John Miles, Director of Field Operations 2

Prepared statements, letters, supplemental materials, et cetera:

- Browning, Jackson B., vice president, health, safety and environmental affairs, Union Carbide Corp., prepared statement of 56
- DuPuy, L.H., assistant plant manager, Institute Plant, prepared statement of 63

- Tyson, Patrick R., Acting Assistant Secretary of Labor for Occupational Safety and Health:

  - Citation and notification of penalty, dated October 1, 1985 11
  - Executive summary of OSHA's response to the accidental aldicarb oxime release 4
  - Letter dated October 1, 1985, to Mr. Hank Karawan, Union Carbide Corp 10
  - Prepared statement of 23

OSHA OVERSIGHT: WORKER HEALTH AND SAFETY AT UNION CARBIDE, INSTITUTE, WV, FACILITY

WEDNESDAY, OCTOBER 2, 1985

House of Representatives,
Committee on Education and Labor,
Subcommittee on Health and Safety,
Washington, DC.

The subcommittee met, pursuant to call, at 9:30 a.m., in room 2261, Rayburn House Office Building, Hon. Joseph M. Gaydos (chairman of the subcommittee) presiding.

Members present: Representatives Gaydos, Hayes, and Chandler.

Staff present from the Subcommittee on Health and Safety: Sy Holzman, deputy staff director; and Lee Bassford, staff assistant.

Staff present from the Committee on Education and Labor: Dorothy L. Strunk, minority senior legislative associate.

Mr. Gaydos. The committee will be in order. Not quite a year ago, in December of 1984, more than 2,000 people died in Bhopal, India, following a release of methyl isocyanate from Union Carbide's Plant there.

Following that tragedy, the Subcommittee on Health and Safety conducted two hearings related to that incident—on December 12, 1984, and February 19, 1985, with particular regard to the health and safety of workers at the Union Carbide Facility in Institute, WV, where MIC also was produced.

During the course of that February hearing, representatives of Union Carbide, OSHA, and the International Association of Machinists Local 656, assured the subcommittee that the plant, especially the MIC unit, was in excellent condition and that there were adequate safety systems and backup systems to prevent an occurrence similar to the one in India from ever happening here in the United States.

Six short months after those pronouncements, on August 11, a different, and perhaps less hazardous substance was released into the atmosphere after the failure of these supposedly adequate safety and warning systems. Six plant employees were hospitalized and about 125 residents in the area required medical attention.

This incident, as well as several others that have occurred at Union Carbide and other facilities in the past few months, raises a number of questions about the effectiveness of these highly rated backup protection systems as well as the validity of the claims made last February.

What we still don't know, from a health standpoint, is whether there will be some future problem for those exposed to the aldicarb oxime leak, as well as leaks of other substances in recent weeks.

Perhaps too much attention was focused on the MIC unit at our previous hearings rather than on the operations of the entire Institute facility, or the chemical industry as a whole, which led to a degree of complacency concerning the health and safety of all concerned.

The recent leaks at other units of Union Carbide's operation in the Institute area and plants elsewhere in the country has shaken that complacency and has reawakened our interest in and concern about the unknown risks we face.

Today's witnesses again represent those who were here at the February hearing. Perhaps they will provide us with a better understanding of what happened last August 11 and give us some idea of what we can expect from future operations.

At this time, we will proceed with our witnesses. The first panel of witnesses will be the Occupational Safety and Health Administration represented by Mr. Patrick R. Tyson, Acting Assistant Secretary of Labor for Occupational Safety and Health, and John Miles, Director of Field Operations.

Before you commence, gentlemen, let me say for the record the committee is cognizant of the fact that there are pending lawsuits involved from prior actions, and if a witness, for reasons best known to himself and probably under instruction of counsel, does not wish to answer an inquiry or question, the committee is not going to press. We understand. Gentlemen, proceed in the manner that would best suit your purposes.

STATEMENT OF PATRICK R. TYSON, ACTING ASSISTANT SECRETARY OF LABOR FOR OCCUPATIONAL SAFETY AND HEALTH, ACCOMPANIED BY JOHN MILES, DIRECTOR OF FIELD OPERATIONS

Mr. TYSON. I have a complete statement that I would like to have introduced into the record. I would also like to read at this time, a summary from that statement.

Mr. GAYDOS. Without objection, the complete statement, as submitted to the committee, Will be made a formal part of the record, and you may proceed with your summation.

Mr. TYSON. Thank you, sir. Mr. Chairman and members of the subcommittee, I am pleased to have the opportunity to describe OSHA's investigation of a recent emission of chemical gases in the aldicarb processing unit at Union Carbide's plant in Institute, WV, and to discuss with you our overall activities to reduce work place hazards at all chemical facilities.

Let me preface my remarks on the incident at the aldicarb unit by noting that there are 18 units at the Institute plant, each of which processes a different chemical substance. One of these is the methyl isocyanate or MIC unit on which we testified before the subcommittee last December 12 and again on February 19 of this year.

As you will recall, we conducted a complete investigation of the Union Carbide MIC production unit last winter following the incident at Bhopal and revisited that unit when it resumed production this spring. In August, we conducted a joint followup inspection of the MIC unit with EPA.

We found no violations on any of these inspections. As you are aware, in August 11, at the Institute's aldicarb unit, a chemical mixture of aldicarb oxime and methylene chloride was inadvertently released into the atmosphere. Six employees and over 100 nearby residents were hospitalized. Within 3 hours of the reported release, an OSHA industrial hygienist arrived at the plant to begin an inspection.

In the course of our investigation of the incident, OSHA compliance officers toured the plant and reviewed process diagrams, illness and injury records and records of employee exposures, written emergency plans, guidelines for use of personal protective equipment, training documents, hazard condition reports, and maintenance reports. Our investigation was not completed in time to include the results of that investigation in the prepared summary, but I would like to read the executive summary of that for the committee now, and ask that that executive summary be admitted into evidence.

Mr. GAYDOS. Without objection, let the chair accept the documentation as presented, and it will be made a part of the formal record.

[The summary referred to follows:]

Executive Summary of OSHA's Response to the Accidental Aldicarb Oxime Release

Union Carbide Corporation
Institute, West Virginia

I. Scope of Inspection

The Occupational Safety and Health Administration (OSHA) conducted an investigation of the Union Carbide facility located in Institute, West Virginia in response to an accidental release of toxic materials in the aldicarb unit on August 11, 1985. The release resulted in the hospitalization of six employees and approximately 135 area residents, who experienced acute eye and upper respiratory irritaton.

In addition to those issues and areas normally covered during an OSHA accident investigation, the Agency devoted additional time to investigate preventive measures regarding hazards associated with normal aldicarb production methods within this unit. This report summarizes the results of the Agency's inspection.

II. OSHA's Investigative Response

On Sunday, August 11, 1985, OSHA's Charleston Area Office became aware of an accidental release of toxic gas at the Institute facility through a public emergency warning broadcast. An industrial hygienist was immediately sent to the facility to determine the nature of the release and the extent of employee exposure. The next day, Monday, August 12, 1985, an industrial hygienist and a supervisor re-entered the facility to formally institute an accident investigation. Subsequently, the investigating industrial hygienist was joined by two industrial hygienists from OSHA's Health Response Team, and an additional industrial hygienist and safety compliance officer. The inspection team remained on-site for approximately three weeks.

III. Documents Reviewed

The inspection required an extensive review of documents maintained by the employer such as:

... The Employer's Record of Workplace Injuries and Illnesses
... Employee Exposure Records
... Written Emergency Plan

- ... Written Guidelines for Use of Personal Protective Equipment
- ... Process Diagrams
- ... Pertinent Training Documents
- ... Hazardous Condition Reports
- ... Maintenance Reports

IV. Process Review

Aldicarb is the active ingredient in the pesticide Temik. It is produced by the reaction of a mixture containing dichloromethane (DCM), aldicarb oxime (ADO), methyl isocyanate (MIC) and a catalyst. The reaction takes place in the methyl carbamoylation (MCB) unit. After the reaction has been completed, the final product is sampled for quality and is transferred to a dedicated storage tank. The aldicarb is shipped to Union Carbide's plant in Woodbine, Georgia for processing into Temik.

Union Carbide began producing aldicarb at Institute in May 1985. Previously, aldicarb had been produced at Union Carbide's Woodbine, Georgia facility.

V. Accident Summary

On August 1, 1985, at approximately 3:30 a.m., it was discovered that the carbamoylation reactor had been overcharged with aldicarb oxime (ADO) in the amount of 10,500 pounds. The reactor also contained dichloromethane (DCM). An hour later, management decided to temporarily transfer a portion of the mixture to a nearby oxidation reactor. The transfer began at 5:00 a.m. and continued for about two-and-a-half hours. The mixture remained in the oxidation reactor until August 7, 1985. On that date, most of the mixture was returned to the carbamoylation reactor to be processed into aldicarb. Approximately 4000 pounds of the mixture was left in the oxidation reactor and was inadvertently heated. The application of heat to the oxidation reactor continued until August 11, 1985, when it produced a self-sustaining exothermic reaction resulting in the decomposition of the aldicarb oxime in the remaining mixture. The vapors were initially vented through a scrubber and flare. The increase in pressure ultimately caused a rupture of gaskets on the knock-out pot and the oxidation reactor allowing the release of toxic vapors into the atmosphere.

VI. OSHA's Conclusions

The Agency has concluded from its investigations that the catastrophic release of toxic chemicals on August 11, 1985, and its resultant exposure of six employees was the cumulative result of several errors:

1. Prior to the transfer of the DCM/ADO mixture to the oxidation reactor, the company failed to follow its standard operating procedures to determine whether the vessel was designed, constructed, and operating properly.

2. The company was not monitoring the DCM/ADO mixture in the oxidation reactor for temperature and pressure changes, and was therefore unaware of a developing problem.

3. On August 7, 1985, the DCM/ADO mixture was transferred out of the oxidation reactor, but the vessel was not completely emptied and approximately 4000 pounds of the mixture remained.

4. A leak in steam lines around the oxidation vessel inadvertently heated the remaining mixture, causing an uncontrolled decomposition reaction.

5. This reaction caused the buildup of substantial pressure in the vessel which could not be safely vented through the emergency venting system because of inadequate design.

6. During the period of buildup before the release, company personnel did not heed system warning alarms of high temperature and pressure.

The Agency has further concluded that the atmospheric release would have been prevented by the company's compliance with the following:

1. Prior to the transfer of the DCM/ADO mixture to the oxidation reactor, the company should have ensured that the vessel was designed and constructed to preclude such a release.

2. The company should have taken appropriate measures to ensure that the temperature and pressure of the DCM/ADO mixture in the oxidation vessel was monitored.

3. The company should have taken steps to ensure that the DCM/ADO mixture was completely emptied from the oxidation reactor in the transfer process to the carbamoylation reactor. This would include provision

of an appropriate gauge on the vessel in proper working order.

4. The company should have ensured that the emergency venting system was adequately designed to prevent the venting of toxic vapors into the atmosphere.

5. The company should have ensured that there were means to determine the triggering event of alarms, such as the high temperature alarm, and that appropriate procedures for such validation existed and were followed.

In addition, the company should have ensured that the control room, Building #244, where employees were required to report in case of an emergency, was adequately designed to preclude internal contamination by the toxic vapors. Moreover, emergency respiratory protective equipment provided for employees was neither sufficiently accessible nor present in adequate amounts.

Accordingly, OSHA has issued citations for alleged violations of Section 5(a)(1) of the Occupational Safety and Health Act and of OSHA's respiratory protection standard, 29 CFR 1910.134, in regard to these deficiencies. Section 5(a)(1) requires that "each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."

The first citation alleges willful violations of Section 5(a)(1), of 29 CFR 1910.134(a)(1) with regard to failure to implement feasible engineering controls, and of 29 CFR 1910.134 (a)(2) for failure to provide adequate respiratory protective equipment. A second citation alleges serious violations of the respiratory protection standard and other OSHA regulations. The total proposed penalty for the violations is $32,100. (See the attached Appendix.)

In addition, the following recommendations were made to company officials as a result of OSHA's inspection:

1. The training of inside and outside operators should include practice drills to respond to emergency conditions.

2. Employee protective clothing or vests should be of a bright color to ensure rapid visual detection of employees in the event of an emergency.

3. The plant deluge system should be interlocked with the toxic gas alarm.

Mr. TYSON. Thank you, Mr. Chairman. Aldicarb is the active ingredient in the pesticide Temik. It is produced by the reaction of a mixture containing dichloromethane and aldicarb oxime, methylene isocyanate, and a catalyst. The reaction takes place in a methyl carbamoylation unit. I'll forgive my pronunciation and I hope the committee will.

After the reaction has been completed, the final product is sampled for quality and is transferred to a dedicated storage tank. The aldicarb is shipped to Union Carbide's plant in Woodbine, GA, for processing into Temik.

Union Carbide began producing aldicarb at Institute in May 1985. Aldicarb had been produced at Union Carbide's Woodbine, GA, facility.

A summary of the accident. On August 1, 1985, at approximately 3:30 a.m., it was discovered that the carbamoylation reactor had been overcharged with aldicarb oxime in the amount of 10,500 pounds. The reactor also contained dichloromethane. An hour later, management decided to temporarily transfer a portion of the mixture to a nearby oxidation reactor. The transfer began at about 5 a.m., and continued for about 2½ hours.

The mixture remained in the oxidation reactor until August 7, 1985. On that date, most of the mixture was returned to the carbamoylation reactor to be processed into aldicarb. Approximately 4,000 pounds of the mixture was left in the oxidation reactor and was inadvertently heated.

The application of heat to the oxidation reactor continued until August 11, 1985, when it produced a self-sustaining exothermic reaction resulting in the decomposition of the aldicarb oxime in the remaining mixture. The vapors were initially vented through a scrubber and flare. The increase in pressure ultimately caused a rupture of gaskets on the knockout pot and the oxidation reactor allowing the release of toxic vapors into the atmosphere.

The Agency has concluded from its investigations that the catastrophic release of toxic chemicals on August 22, 1985, and its resultant exposure of six employees was the cumulative result of several errors.

No. 1. Prior to the transfer of the mixture to the oxidation reactor, the company failed to follow its standard operating procedures to determine whether the oxidized reactor vessel was designed, constructed and operating properly.

No. 2. The company was not monitoring the mixture in the oxidation reactor for temperature and pressure changes and was therefore unaware of a developing problem.

No. 3. On August 7, 1985, the mixture was transferred out of the oxidation reactor, but the vessel was not completely emptied, and approximately 4,000 pounds of the mixture remained.

No. 4. A leak in steam lines around the oxidation vessel inadvertently heated the remaining mixture causing an uncontrolled decomposition reaction.

No. 5. This reaction caused the buildup of substantial pressure in the vessel which could not be safely vented through the emergency venting system because of inadequate design.

No. 6. During the period of buildup before the release, company personnel did not heed system warning alarms of high temperature and pressure.

The Agency has further concluded that the atmospheric release would have been prevented by the company's compliance with the following:

No. 1. Prior to the transfer of the mixture to the oxidation reactor, the company should have insured that the vessel was designed and constructed to preclude such a release.

No. 2. The company should have taken appropriate measures to insure that the temperature and pressure of the mixture in the oxidation vessel was monitored.

No. 3. The company should have taken steps to insure that the mixture was completely emptied from the oxidation reactor and the transfer process to the carbamoylation reactor. This would include provision for an appropriate gage on the vessel in proper working order.

No. 4. The company should have insured that the emergency venting system was adequately designed to prevent the venting of toxic vapors into the atmosphere.

No. 5. The company should have insured that there were means to determine the triggering event of alarm, such as the high temperature alarm, and that appropriate procedures for such validation existed and were followed.

In addition, the company should have insured that the control room which is building No. 244, where employees were required to report in case of an emergency, was adequately designed to preclude internal contamination by the toxic vapors. Moreover, emergency respiratory protective equipment provided for employees was neither sufficiently accessible nor present in adequate amounts.

Accordingly, OSHA has issued citations for alleged violations of section 5(a)(1) of the Occupational Safety and Health Act and of OSHA's respiratory protection standard, 29 CFR 1910.134, in regard to these deficiencies. Section 5(a)(1) of the act requires that each employer shall furnish to each of his employees employment and a place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.

The first citation alleges willful violations of 5(a)(1), of 29 CFR 1910.134(a)(1) with regard to the failure to implement feasible engineering controls and of 29 CFR 1910.134(a)(2) for failure to provide adequate respiratory protective equipment.

A second citation alleges serious violations of the respiratory protection standard and other OSHA regulations. The total proposed penalty for the violations is $32,100.

The committee has accepted the executive summary. I would also like to introduce a copy of the citations for the committee's use and ask that they be included in the record.

[The citations submitted for the record follow:]

U.S. Department of Labor

Occupational Safety and Health Administration
550 Eagan Street - Room 206
Charleston, West Virginia 25301
Reply to the Attention of:
(304) 347-5937

October 1, 1985

Mr. Hank Karawan:
Union Carbide Corporation
P. O. Box 2831
Charleston, WV 25330

Dear Mr. Karawan:

As a result of the August 12, 1985 inspection of the MCB unit at the Institute plant, we determined six violations of OSHA standards/regulations. In addition the inspection uncovered several hazards which though not violations of our standards, warrant your attention and reevaluation. We offer the following recommendations relative to these hazards:

1. The training of inside and outside operators should include practice drills to respond to emergency conditions.
2. Protective clothing or vest should be of a bright color to ensure rapid visual detection of employees in the event of an emergency.
3. The deluge system should be interlocked with the toxic gas alarm.

Sincerely,

Perry D Jones

Perry D. Jones
Area Director

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street
Charleston, WV 25301

3. Issuance Date	4. Inspection Number
10/1/85	000616409
5. Reporting ID	6. CSHO ID
0316400	R8688
7. Optional Report No	8. Page No
163	1 of 4

1. Type of Violation(s)	2. Citation Number
Serious	02

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below

10. Inspection Date(s)
8/12/85

11. Inspection Site
Route 25
Institute, WV 25112

9. To
Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

Penalties Are Due Within 15 Days of Receipt of This Notification Unless Contested
(See enclosed Booklet)

This Section May Be Detached Before Posting

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated, or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number 13. Standard, Regulation or Section of the Act Violated / 14. Description	15. Date by Which Violation Must Be Abated	16. Penalty
1 29 CFR 1910.134(a)(2): Respirators were not provided by the employer when such equipment was necessary to protect the health of the employees: (a) Emergency respiratory protective equipment was not provided for employees temporarily assigned to work in the MCB unit. On August 27, 1985, at least six insulation workers were observed on the top level of the Phase II Reactor Vessel and were without emergency escape respirators. (b) Emergency respiratory protective equipment was not provided for employees in Building 8773 (temporary office trailer.)	Immediately Upon Receipt	800.0

17. Area Director
Perry D. Jones
Perry D. Jones

18. Last Pg

Total Penalty for This Citation

Make Check or Money Order Payable to "DOL-OSHA"

Indicate Inspection Number on Remittance

NOTICE TO EMPLOYEES — The law gives an employee or his representative the opportunity to object to any abatement date set for a violation if he believes the date to be unreasonable. The contest must be mailed to the U.S. Department of Labor Area Office at the address shown above within 15 working days (excluding weekends and Federal holidays) of the receipt by the employer of this Citation and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

EMPLOYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and should be read in conjunction with this notification.

ORIGINAL

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street
Charleston, WV 25301

1. Type of Violation(s)	2. Citation Number
Serious	02

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below

3. Issuance Date 10/1/85	4. Inspection Number 000616409
5. Reporting ID 0316400	6. CSHO ID R8688
7. Optional Report No 163	8. Page No 2 of 4

10. Inspection Date(s)

8/12/85

11. Inspection Site

Route 25
Institute, WV 25112

9. To

Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

Penalties Are Due Within 15 Days of Receipt of This Notification Unless Contested (See enclosed Booklet)

This Section May Be Detached Before Posting

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number 13. Standard, Regulation or Section of the Act Violated	14. Description	15. Date by Which Violation Must Be Abated	16. Penalty
2 29 CFR 1910.134(e)(3):	Written procedures shall be prepered covering safe use of emergency respirators in dangerous atmospheres:	Immediately Upon Receipt	600.00

(a) The company's written standard operating procedure governing the use of emergency respirators was inadequate as it did not address the issue of quantity of respirators for the maximum number of MCB unit employees located in Building 244 at any one time.

17. Area Director Perry D. Jones Perry D. Jones

18. Last Pg

Total Penalty for This Citation

Make Check or Money Order Payable to DOL-OSHA

Indicate Inspection Number on Remittance

NOTICE TO EMPLOYEES — The law gives an employee or 'is representative the opportunity to object to any abate- nent date set for a violation if he believes the date to be nreasonable. The contest must be mailed to the U.S. partment of Labor Area Office at the address shown ve within 15 working days (excluding weekends and 'eral holidays) of the receipt by the employer of this Cita- and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

OYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and 1 be read in conjunction with this notification.

ORIGINAL

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street
Charleston, WV 25301

1. Type of Violation(s)	2. Citation Number
Serious	02

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below

3. Issuance Date	4. Inspection Number
10/1/85	000616409
5. Reporting ID	6. CSHO ID
0316400	R8688
7. Optional Report No	8. Page No
163	3 of 4

10. Inspection Date(s)
8/12/85

11. Inspection Site
Route 25
Institute, WV 25112

9. To

Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

Penalties Are Due Within 15 Days of Receipt of This Notification Unless Contested

See enclosed Booklet

This Section May Be Detached Before Posting

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated, or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number 13. Standard, Regulation or Section of the Act Violated / 14. Description	15. Date by Which Violation Must Be Abated	16. Penalty
The alleged violations below have been grouped because they involve similar or related hazards that may increase the potential for injury resulting from an accident.		
3a 29 CFR 1910.305(g)(1)(i): Flexible cords and cables were not approved and suitable for conditions of use and location:	Immediately Upon Receipt	700.00
(a) On August 23, 1985, a flexible cord with two extra female outlets spliced into it was in use at the Phase II reactor a Class I, Division 2 location. This 110-volt AC extension cord after being spliced was not approved or suitable for a hazardous location.		
3b 29 CFR 1910.305(g)(2)(ii): Flexible cords were not used in continuous lengths without splice or tap:	Immediately Upon Receipt	
(a) On August 23, 1985, an extension-type flexible cord with two splices in it was used to supply power to portable tools which were being used on the ground level of the		

17. Area Director
Perry D. Jones
Perry D. Jones

18. Last Pg
Total Penalty for This Citation

Make Check or Money Order Payable to "DOL-OSHA"

Indicate Inspection Number on Remittance

NOTICE TO EMPLOYEES — The law gives an employee or his representative the opportunity to object to any abatement date set for a violation if he believes the date to be unreasonable. The contest must be mailed to the U.S. Department of Labor Area Office at the address shown above within 15 working days (excluding weekends and Federal holidays) of the receipt by the employer of this Citation and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

EMPLOYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and should be read in conjunction with this notification.

ORIGINAL

CITATION AND NOTIFICATION OF PENALTY

OSHA-2 (Rev. 1/84)

(4)

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street
Charleston, WV 25301

1. Type of Violation(s)	2. Citation Number
Serious	02

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below.

3. Issuance Date	4. Inspection Number
10/1/85	000616409
5. Reporting ID	**6.** CSHO ID
0316400	R8688
7. Optional Report No	**8.** Page No
153	4 of 4

10. Inspection Date(s)
8/12/85

11. Inspection Site
Route 25
Institute, WV 25112

9. To
Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

Penalties Are Due Within 15 Days of Receipt of This Notification Unless Contested
(See enclosed Booklet)

This Section May Be Detached Before Posting

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number 13. Standard, Regulation or Section of the Act Violated	14. Description	15. Date by Which Violation Must Be Abated	16. Penalty
	Phase II Reactor.		

17. Area Director Perry D. Jones Perry D. Jones

18. $ 2100.00

Total Penalty for This Citation

Make Check or Money Order Payable to: "DOL-OSHA"

Indicate Inspection Number on Remittance

NOTICE TO EMPLOYEES — The law gives an employee or his representative the opportunity to object to any abatement date set for a violation if he believes the date to be unreasonable. The contest must be mailed to the U.S. Department of Labor Area Office at the address shown above within 15 working days (excluding weekends and Federal holidays) of the receipt by the employer of this Citation and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

EMPLOYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and should be read in conjunction with this notification.

ORIGINAL

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street
Charleston, WV 25301

1. Type of Violation(s)	2. Citation Number
Willful	01

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below

3. Issuance Date	4. Inspection Number
10/1/85	000616409
5. Reporting ID	6. CSHO ID
0316400	R8688
7. Optional Report No	8. Page No
163	1 of 7

10. Inspection Date(s)
8/12/85

11. Inspection Site
Route 25
Institute, WV 25112

9. To
Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated, or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number 13. Standard, Regulation or Section of the Act Violated — 14. Description	15. Date by Which Violation Must Be Abated	16. Pen
1 Section 5(a)(1) of the Occupational Safety and Health Act of 1970: The employer did not furnish employment and a place of employment which were free from recognized hazards that were causing or likely to cause death or serious physical harm to employees in that on August 11, 1985, four employees in the MCB unit were potentially exposed to the hazard of the rupture of a pressure vessel due to an uncontrolled decomposition reaction of Aldicarb Oxime (ADO) in the Oxidation reactor. The following conditions contributed to the potential exposure: (a) On August 1, 1985, approximately 10,500 pounds of a mixture of dichloromethane (DCM) and Aldicarb Oxime (ADO) having an in-house toxicity rating of "4" was transferred from a carbamoylation reactor to an oxidation reactor. The oxidation reactor had been out of service since November, 1984. The transfer was performed contrary to the company's standard operating procedures which require that a safety survey be conducted prior to any transfer of any material with a flammability/toxicity rating of "4" or prior to transfer to any vessel which had been out of service for	Immediately Upon Receipt	10(

17. Area Director
Perry D. Jones   Perry D. Jones

NOTICE TO EMPLOYEES — The law gives an employee or his representative the opportunity to object to any abatement date set for a violation if he believes the date to be unreasonable. The contest must be mailed to the U.S. Department of Labor Area Office at the address shown above within 15 working days (excluding weekends and Federal holidays) of the receipt by the employer of this Citation and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

EMPLOYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and should be read in conjunction with this notification.

ORIGINAL

6

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street
Charleston, WV 25301

1. Type of Violation(s)	2. Citation Number
Willful	01

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below

3. Issuance Date	4. Inspection Number
10/1/85	000616409
5. Reporting ID	**6.** CSHO ID
0316400	R8688
7. Optional Report No	**8.** Page No
163	2 of 7

10. Inspection Date(s)

8/12/85

11. Inspection Site

Route 25
Institute, WV 25112

Penalties Are Due Within 15 Days of Receipt of This Notification Unless Contested

(See enclosed Booklet)

This Section May Be Detached Before Posting

9. To

Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated, or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number **13.** Standard, Regulation or Section of the Act Violated	**14.** Description	**15.** Date by Which Violation Must Be Abated	**16.** Penalty
	more than 4 months.		
(b)	The DCM/ADO mixture was stored in the oxidation reactor from August 1 to August 7, 1985. The mixture was not monitored during this period for temperature or pressure changes. Monitoring of material in storage is a standard company practice.		
(c)	On August 7, 1985, the computerized high temperature alarm sounded. The system was inadequate in that there was no instrumentation to determine the actual temperature prior to deactivation of the alarm.		
(d)	On August 7, 1985, the DCM/ADO mixture temporarily stored in the oxidation reactor was transferred to the carbamoylation reactor. Approximately 4,000 pounds of the DCM/ADO mixture remained in the oxidation reactor. The liquid level gauge on both reactors did not reach the heel of either vessel contributing to the incomplete transfer. The failure to design the gauges to reach the heel of these multi-use pressure vessels is contrary to industry practice.		

17. Area Director Perry D. Jones Perry D. Jones

18. Last Pg

Total Penalty for This Citation

Make Check or Money Order Payable to "DOL-OSHA"

Indicate Inspection Number on Remittance

NOTICE TO EMPLOYEES — The law gives an employee or his representative the opportunity to object to any abatement date set for a violation if he believes the date to be unreasonable. The contest must be mailed to the U.S. Department of Labor Area Office at the address shown above within 15 working days (excluding weekends and Federal holidays) of the receipt by the employer of this Citation and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

EMPLOYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and should be read in conjunction with this notification.

ORIGINAL

CITATION AND NOTIFICATION OF PENALTY

OSHA-2 (Rev. 1/84)

0

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street
Charleston, WV 25301

1. Type of Violation(s)	2. Citation Number
Willful	01

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below.

3. Issuance Date 10/1/85	4. Inspection Number 000616409
5. Reporting ID 0316400	6. CSHO ID B8688
7. Optional Report No 163	8. Page No 3 of 7

10. Inspection Date(s)
8/12/85

11. Inspection Site
Route 25
Institute, WV 25112

9. To

Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

Penalties Are Due Within 15 Days of Receipt of This Notification Unless Contested (See enclosed Booklet)

This Section May Be Detached Before Posting

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated, or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number 13. Standard, Regulation or Section of the Act Violated	14. Description	15. Date by Which Violation Must Be Abated	16. Penalty

(e) After the incomplete transfer on August 7, 1985, and until August 11, 1985, the DCM/ADO mixture remaining in the oxidation reactor was heated by steam which leaked into the vessel's steam jacket. On August 11, 1985, the remaining ADO decomposed in an uncontrolled reaction. That uncontrolled reaction caused excessive pressure which caused the gaskets on the oxidation reactor to burst.

Feasible methods of abatement, among others, are to:

1. Assess and evaluate the material to be transferred and the vessel to which any transfer is to be made prior to any transfer to determine the following:

17. Area Director
Perry D. Jones Perry D. Jones

18. Last Pg

Total Penalty for This Citation

Make Check or Money Order Payable to "DOL-OSHA"

Indicate Inspection Number on Remittance

NOTICE TO EMPLOYEES — The law gives an employee or his representative the opportunity to object to any abatement date set for a violation if he believes the date to be unreasonable. The contest must be mailed to the U.S. Department of Labor Area Office at the address shown above within 15 working days (excluding weekends and Federal holidays) of the receipt by the employer of this Citation and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

EMPLOYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and should be read in conjunction with this notification.

ORIGINAL

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street
Charleston, WV 25301

1. Type of Violation(s)	2. Citation Number
Willful	01

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below.

3. Issuance Date 10/1/85	4. Inspection Number 000616409
5. Reporting ID 0316400	6. CSHO ID R8688
7. Optional Report No 163	8. Page No 4 of 7

10. Inspection Date(s)
8/12/85

11. Inspection Site
Route 25
Institute, WV 25112

Penalties Are Due Within 15 Days of Receipt of This Notification Unless Contested
(See enclosed Booklet)

This Section May Be Detached Before Posting

9. To
Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated, or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number 13. Standard, Regulation or Section of the Act Violated	14. Description	15. Date by Which Violation Must Be Abated	16. Penalty
	(a) The toxicity, flammability, and reactivity of the material to be transferred. (b) The design and construction of the vessel in light of the physical and chemical characteristics of the material, and the quantity of the material to be transferred. (c) The proper valving of all lines of the vessel. (d) That the vessel and all valves, lines, gauges, and controls were cleaned and tested. (e) That the vessel was properly vented. 2. Monitor all material in storage for temperature and pressure changes. 3. Determine the amount of the material transferred through mass balance calculation or through the proper location of liquid level gauges.		

17. Area Director
Perry D. Jones Perry D. Jone

18. Last Pg
Total Penalty for This Citation
Make Check or Money Order Payable to "DOL-OSHA"
Indicate Inspection Number on Remittance

NOTICE TO EMPLOYEES — The law gives an employee or his representative the opportunity to object to any abatement date set for a violation if he believes the date to be unreasonable. The contest must be mailed to the U.S. Department of Labor Area Office at the address shown above within 15 working days (excluding weekends and Federal holidays) of the receipt by the employer of this Citation and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

EMPLOYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and should be read in conjunction with this notification.

ORIGINAL

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street

1. Type of Violation(s)	2. Citation Number
Willful	01

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below

3. Issuance Date: 10/1/85
4. Inspection Number: 000616409
5. Reporting ID: 0316400
6. CSHO ID: R8688
7. Optional Report No: 163
8. Page No: 5 of 7
10. Inspection Date(s): 8/12/85

11. Inspection Site

Route 25
Institute, WV 25112

9. To

Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

Penalties Are Due Within 15 Days of Receipt of This Notification Unless Contested (See enclosed Booklet)

This Section May Be Detached Before Posting

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated, or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number 13. Standard, Regulation or Section of the Act Violated	14. Description	15. Date by Which Violation Must Be Abated	16. Penalty
	4. Implement an effective redundant instrument system to validate alarms.		

17. Area Director: Perry D. Jones

Perry D. Jones

18. Last Pg

Total Penalty for This Citation

Make Check or Money Order Payable to: "DOL-OSHA"

Indicate Inspection Number on Remittance

NOTICE TO EMPLOYEES — The law gives an employee or his representative the opportunity to object to any abatement date set for a violation if he believes the date to be unreasonable. The contest must be mailed to the U.S. Department of Labor Area Office at the address shown above within 15 working days (excluding weekends and Federal holidays) of the receipt by the employer of this Citation and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

EMPLOYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and should be read in conjunction with this notification.

ORIGINAL

CITATION AND NOTIFICATION OF PENALTY

OSHA-2 Rev. 1/84)

(10)

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street
Charleston, WV 25301

1. Type of Violation(s)	2. Citation Number
Willful	01

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below

3. Issuance Date	4. Inspection Number
10/1/85	000616409
5. Reporting ID	6. CSHO ID
0316400	R8688
7. Optional Report No.	8. Page No.
163	6 of 7

10. Inspection Date(s)
8/12/85

11. Inspection Site
Route 25
Institute, WV 25112

Penalties Are Due Within 15 Days of Receipt of This Notification Unless Contested (See enclosed Booklet)

This Section May Be Detached Before Posting

9. To

Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number 13. Standard, Regulation or Section of the Act Violated	14. Description	15. Date by Which Violation Must Be Abated	16. Penalty
2 29 CFR 1910.134(a)(1):	Engineering controls were not implemented which would prevent atmospheric contamination by harmful vapors:	Immediately Upon Receipt	10000.0

(a) On August 11, 1985, at the MCB unit, six employees were exposed to the decomposition products of a dichloromethane/aldicarb oxime (DCM/ADO) mixture. The following issues contributed to this exposure.

a. Prior to the transfer on August 1, 1985 of the DCM/ADO mixture to the oxidation reactor, the company failed to ensure the vessel was designed and constructed to preclude a release to the atmosphere.

b. During the period August 1, 1985 - August 7, 1985, the DCM/ADO mixture in the oxidation reactor was not monitored for temperature and pressure changes.

c. The liquid level gauge on the oxidation reactor was so located that it was not possible to ascertain whether the DCM/ADO mixture was completely transferred to the

17. Area Director
Perry D. Jones
Perry D. Jones

18. Last Pg

Total Penalty for This Citation

Make Check or Money Order Payable to DOL-OSHA

Indicate Inspection Number on Remittance

NOTICE TO EMPLOYEES — The law gives an employee or his representative the opportunity to object to any abatement date set for a violation if he believes the date to be unreasonable. The contest must be mailed to the U.S. Department of Labor Area Office at the address shown above within 15 working days (excluding weekends and Federal holidays) of the receipt by the employer of this Citation and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

EMPLOYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and should be read in conjunction with this notification.

ORIGINAL

11

U.S. Department of Labor
Occupational Safety and Health Administration

Citation and Notification of Penalty

U.S. Department of Labor - OSHA
Room 206
550 Eagan Street

1. Type of Violation(s)	2. Citation Number
Willful	01

The violation(s) described in this Citation are alleged to have occurred on or about the day the inspection was made unless otherwise indicated within the description given below.

3. Issuance Date	4. Inspection Number
10/1/85	000616409

5. Reporting ID	6. CSHO ID
0316400	B8688

7. Optional Report No.	8. Page No.
163	2 of 2

10. Inspection Date(s): 8/12/85

11. Inspection Site:

Route 25
Institute, WV 25112

9. To:

Union Carbide Corporation
and its successors
Post Office Box 2831
Charleston, WV 25330

Penalties Are Due Within 15 Days of Receipt of This Notification Unless Contested
(See enclosed Booklet)

This Section May Be Detached Before Posting

THE LAW REQUIRES that a copy of this Citation be posted immediately in a prominent place at or near the location of the violation(s) cited below. The Citation must remain posted until the violations cited below have been abated, or for 3 working days (excluding weekends and Federal holidays), whichever is longer.

This Citation describes violations of the Occupational Safety and Health Act of 1970. The penalty(ies) listed below are based on these violations. You must abate the violations referred to in this Citation by the dates listed below and pay the penalties proposed, unless within 15 working days (excluding weekends and Federal holidays) from your receipt of this Citation and penalty you mail a notice of contest to the U.S. Department of Labor Area Office at the address shown above. (See the enclosed booklet which outlines your rights and responsibilities and should be read in conjunction with this form.) You are further notified that unless you inform the Area Director in writing that you intend to contest the Citation or proposed penalties within 15 working days after receipt, this Citation and the proposed penalties will become a final order of the Occupational Safety and Health Review Commission and may not be reviewed by any court or agency. Issuance of this Citation does not constitute a finding that a violation of the Act has occurred unless there is a failure to contest as provided for in the Act or, if contested, unless the Citation is affirmed by the Review Commission.

12. Item Number 13. Standard, Regulation or Section of the Act Violated	14. Description	15. Date by Which Violation Must Be Abated	16. Penalty
	carbamoylation reactor on August 7, 1985/		
	d. The design of the emergency venting system (knock-out pot, scrubber and flare) did not ensure that toxic vapors would not be vented to the atmosphere.		
	e. The control room (Building 244) where employees were required to work was not designed to preclude internal atmospheric contamination by toxic vapors.		
3 29 CFR 1910.134(a)(2):	Respirators were not provided by the employer when such equipment was necessary to protect the health of the employees:	Immediately Upon Receipt	10000.00
	(a) Emergency respiratory protective equipment for MCB unit employees was stored in the anteroom of Building 244; the equipment was neither quickly accessible to all unit employees in the building nor adequate in amount during the August 11, 1985 release of toxic vapors.		

17. Area Director: Perry D. Jones

18. $30000.00
Total Penalty for This Citation

Make Check or Money Order Payable to DOL-OSHA

Indicate Inspection Number on Remittance

NOTICE TO EMPLOYEES — The law gives an employee or his representative the opportunity to object to any abatement date set for a violation if he believes the date to be unreasonable. The contest must be mailed to the U.S. Department of Labor Area Office at the address shown above within 15 working days (excluding weekends and Federal holidays) of the receipt by the employer of this Citation and penalty.

EMPLOYER DISCRIMINATION UNLAWFUL — The law prohibits discrimination by an employer against an employee for filing a complaint or for exercising any rights under this Act. An employee who believes that he has been discriminated against may file a complaint no later than 30 days after the discrimination with the U.S. Department of Labor Area Office at the address shown above.

EMPLOYER RIGHTS AND RESPONSIBILITIES — The enclosed booklet outlines employer rights and responsibilities and should be read in conjunction with this notification.

ORIGINAL

Mr. TYSON. On September 17, OSHA began a wall-to-wall inspection of all units in Union Carbide's Institute plant. We expect that inspection to occupy the attention of five three-person OSHA teams for a period of approximately 6 months.

One of OSHA's objectives for fiscal year 1985 was to refine the Agency's system for targeting health inspections. As part of that effort, we set up an internal task force to suggest improvements and inspections of chemical plants. The task force was able to build on the experience acquired from the inspections done on the MIC processing facilities and to recommend a pilot program to try a new approach to inspections in chemical plants.

Labor unions and employers in the chemical industry have had an opportunity to comment on the proposal as have EPA and the National Advisory Committee on Occupational Safety and Health.

Under this new Pilot Program, plants will be selected for inspection on the basis of the presence of chemicals generally considered to be the most dangerous, and not on the basis of past history of serious violations as under our present health targeting systems.

Area offices located near concentrations of chemical plants in regions II, III, V, and VI will be selected to inspect a limited number of such sites in fiscal year 1986. The Pilot Program is scheduled to begin with the new fiscal year, and if successful, the program will be extended to all chemical plants in subsequent years.

Inspections conducted under this new program will pay particular attention to safety processes in order to assess the adequacy of these procedures in preventing and containing spills and leaks. The focus will be on the prevention of future hazards as well as the discovery of existing ones.

One of the objectives of the program will be to encourage employers to develop safety plans where none exists and to improve existing emergency and preventive plans where those are deficient. Inspections teams will review plant standard operating procedures, backup safety systems, spill containment methods, preventive maintenance programs, training programs, and emergency response procedures.

OSHA's training institute will offer a special course on safety and health in the chemical industry for all compliance officers involved in the new program. This course was developed in consultation with labor unions and employers in the chemical industry, and the course will eventually be made available to the entire public.

Mr. Chairman, that concludes my summary of the prepared statement. I'll be happy to answer any questions the committee may have.

[The prepared statement of Patrick R. Tyson follows:]

PREPARED STATEMENT OF PATRICK R. TYSON, ACTING ASSISTANT SECRETARY OF LABOR FOR OCCUPATIONAL SAFETY AND HEALTH

Mr. Chairman and Members of the Subcommittee:

Thank you for the opportunity to describe the investigation by the Occupational Safety and Health Administration (OSHA) of a recent emission of chemical gases in the aldicarb processing unit at Union Carbide's plant in Institute, West Virginia, and to discuss with you OSHA's overall efforts to reduce workplace hazards at chemical facilities throughout the country.

There are eighteen units at the Union Carbide Institute plant, each processing a different chemical substance. One of these is the aldicarb unit in which the Subcommittee has expressed an interest. Another is the methyl isocyanate (MIC) unit, on which we testified before this Subcommittee in December 1984, and again in February of this year. As you will recall, OSHA completed a comprehensive inspection of the MIC unit at the Institute plant following a three-month investigation in which the agency also inspected all other facilities in the country which use MIC in significant quantities. In the spring of 1985 when MIC production was resumed at the Institute plant, OSHA again visited the MIC unit at that facility. In addition, a joint follow-up inspection was conducted in the MIC unit by OSHA and the Environmental Protection Agency (EPA) on August 29, 1985. No violations were found on either inspection.

At the aldicarb unit, a chemical mixture made up of thirty-five percent aldicarb oxime and sixty-five percent methylene chloride (dichloromethane) was inadvertently released into the atmosphere on August 11. As a result, six plant employees were hospitalized, and approximately 125 residents of the surrounding area received medical attention. Within three hours of the reported release, an OSHA industrial hygienist arrived at the plant to begin an inspection.

The mixture of aldicarb oxime and methylene chloride which escaped on August 11 is an intermediary in the manufacture of Union Carbide's pesticide, "Temik." Methylene chloride is mixed with aldicarb oxime to keep it fluid. The aldicarb oxime is then combined with methyl isocyanate to form aldicarb, the active ingredient in Temik, which is produced at Union Carbide's facility in Woodbine, Georgia. We know that aldicarb oxime is a skin and eye irritant, but no threshold limit value has been established, treatment is symptomatic, and no specific antidote is known.

Methylene chloride, on the other hand, is a solvent that is widely used, principally in paint removers and aerosol products. OSHA's standard for this substance sets a permissible exposure limit of 500 parts per million parts of air for an 8-hour time-weighted average exposure and sets a short-term exposure limit of 2,000 parts per million parts of air for a five-minute period within any two hours of the workday. The Occupational Health Guidelines issued jointly in 1981 by the National Institute for Occupational Safety and Health (NIOSH) and by OSHA provide detailed health hazard information on methylene chloride, guidelines for its safe use, and procedures to be followed in the event of spills or leaks.

Several years ago OSHA requested the Department of Health and Human Services' National Toxicology Program (NTP) to test methylene chloride for carcinogenicity. The NTP bioassay was recently completed, and a draft report of the results of the study indicates that the chemical is a carcinogen in two animal species. EPA is currently preparing an Advance Notice of Proposed Rulemaking for methylene chloride on the basis of its being a probable human carcinogen. OSHA is participating in this rulemaking. We have submitted a number of questions for inclusion in EPA's Advance Notice and are assisting in review of the document.

In the course of OSHA's onsite investigation at Union Carbide's aldicarb unit, agency compliance officers toured the plant and reviewed process diagrams, employers' records of illness and injury and of employee exposures, written emergency plans, guidelines for use of personal protective equipment, training documents, hazardous condition reports, and maintenance reports. Our investigation has now been completed. OSHA's findings were not available at the time of preparation of this statement, but I will summarize them for the Subcommittee this morning.

* * *

On September 17, OSHA began a wall-to-wall inspection of all units at Union Carbide's Institute plant. We expect the inspection to occupy the attention of five three-person OSHA teams for a period of approximately six months.

Special Emphasis Program in the Chemical Industry

One of OSHA's objectives for FY 1985 was to refine the agency's system for targeting health inspections. As part of this effort, an internal task force composed of national office and field staff, as well as representatives of state OSHA programs, was established to suggest improvements in inspections of chemical plants. Building on the valuable experience acquired from the inspections done of MIC-processing facilities in the first six months of the fiscal year, the task force recommended a pilot program to try a new resource-intensive approach to inspections in chemical plants throughout the country. The proposal has been circulated for comment to various labor unions and employers in the chemical industry as well as to EPA and the National Advisory Committee on Occupational Safety and Health.

Under the new pilot program, plants will be selected for inspection not on the basis of past history of serious health violations, as is the case under the current health targeting system, but rather on the basis of the presence in those plants of the chemicals generally considered to be the most dangerous. Area Offices located near concentrations of chemical plants in Regions II, III, V, and VI will be selected to inspect a limited number of such sites in FY 1986. The states that operate their own federally approved OSHA programs are being encouraged to participate by developing similar programs. The pilot program is scheduled to begin in the new fiscal year. If successful, the program may be extended to all chemical plants in subsequent years.

Inspections conducted under the new special emphasis program will pay particular attention to safety processes in order to assess the adequacy of those processes in preventing and containing spills and leaks. The focus will be on prevention of future hazards as well as discovery of existing ones. One of the objectives of the program will be to encourage employers to develop safety plans where none exists and to improve existing emergency and preventive plans where they are deficient.

The inspection teams will review a plant's standard operating procedures, back-up safety systems, spill-containment methods, preventive maintenance programs, training program and emergency response procedures.

Training for the New Special Emphasis Program

OSHA's Training Institute in Des Plaines, Illinois, which conducts classes in industrial hygiene and toxicology as part of the regular curriculum to train Federal and State OSHA personnel, will offer a week-and-a-half course on safety and health in the chemical industry. The course was designed with the new special emphasis program in mind; industry and labor unions were consulted in its development. All compliance officers involved in the special emphasis program will attend. The course, which will be given twice in the coming fiscal year, will consist of technical training in chemical processes and procedures, safety audit and hazard assessment methods, and emergency preparedness techniques, as well as instruction on the characteristics of chemical process hazards. Plans are being made to include a tour of a chemical facility to highlight emergency prevention and response procedures.

OSHA's Inspections in the Chemical Industry

Over the past few years OSHA has maintained a high inspection presence in the chemical industry. We hope to continue to do so using the new approach I have outlined. In FY 1984, Federal OSHA inspected 1,479 chemical manufacturing plants. (In that same year the States inspected an additional 907 chemical plants.) In the first ten months of FY 1985, the agency has conducted 1,228 federal inspections of chemical facilities. There are about 11,000 chemical manufacturing facilities nationwide, an estimated 6,700 of which are under Federal OSHA coverage and 4,300 under the State-Plan states. Thus, in a year, OSHA has inspected more than one in every five chemical plants in the country. To put this inspection presence in the chemical industry in perspective, let me remind you that in FY 1984, Federal OSHA inspected one in every 40 of all the establishments it covers, and one in every six manufacturing establishments.

Hazard Communication Standard

One of OSHA's most important new regulations affecting the chemical industry, the Hazard Communication Standard, is about to go into effect. This standard, as you are aware, requires the creation of information in the form of labels and material safety data sheets to apprise employees about chemical hazards in their workplaces. Chemical manufacturers and importers must provide such information to their own employees and to industrial users of their products. Most importantly, the standard requires those employers to provide training to ensure that employees working with chemical substances know what the hazards are and what precautions should be taken to contain those hazards. The requirements for chemical manufacturers, importers and distributors to provide downstream users with labels and material safety data sheets become effective on November 25, 1985. All other provisions go into effect on May 25, 1986.

In the two years since the Hazard Communication Standard was promulgated, OSHA has been preparing for its implementation. The agency has conducted seminars for interested parties throughout the country and has made a special effort to train its own compliance officers in enforcement of the new rule. An agency directive issued on August 5 establishes the procedures to be followed by compliance officers in enforcing the standard. Among other things, they are to evaluate the adequacy and availability of material safety data sheets. The standard requires these sheets to include information on precautions to be taken and procedures to be followed in the event of an emergency arising from a chemical release. Agency compliance officers are also to assess employer compliance with the training provisions of the standard. Those provisions include requirements that employees receive training at the time they are assigned to work with a hazardous chemical and that instruction in emergency procedures be included in such training. Review of these requirements will assist OSHA in evaluating a facility's capability to protect employees in emergencies arising from chemical spills and leaks.

OSHA's Voluntary Compliance Efforts

In addition to enforcement of standards, OSHA has other resources available under the Occupational Safety and Health Act with which to address potential hazards in the chemical industry. These resources are well known to the Subcommittee and include such programs as onsite consultation, which assists small business employers in recognizing and abating workplace hazards, and Voluntary Protection Programs (VPP), which provide incentives for employers to work cooperatively with employees to develop and maintain outstanding safety and health programs. After a rigorous review of their overall safety plans, including emergency response plans and procedures, twenty-one chemical plants have been approved for VPP's select ranks.

OSHA's New Directions training grants encourage non-profit employer and labor associations to develop competency in education and training as well as in technical aspects of occupational safety and health. Several New Directions grantees have focused their attention on working conditions in chemical plants.

OSHA also prepares informational material to assist employees and managers in containing potential hazards in the chemical industry. The agency has recently reissued a pamphlet, which has been in much demand in the past year. The pamphlet, entitled "How to Prepare for Workplace Emergencies," outlines the basic steps to be taken in the event of job-related emergencies such as chemical spills or releases of toxic gases. OSHA is also drafting a self-help checklist for chemical manufacturers to follow in evaluating their company systems for preventing leaks and spills. The checklist is based on guidelines prepared for OSHA compliance officers conducting chemical inspections.

That completes my prepared statement. I will be happy to answer any questions you may have.

Mr. GAYDOS. Mr. Miles, do you have a statement?

Mr. TYSON. No, sir, he does not.

Mr. GAYDOS. Mr. Chander.

Mr. CHANDER. I know about as much about this issue from what I was able to read in the paper this morning. It does strike me that the proposed fine, you said something like $32,000, is relatively small when you use the term willful violations of the regulations.

I am wondering if this isn't just a slap on the wrist for what was in your own terms willful violations and created a very, very hazardous condition.

Mr. TYSON. Basically I have two responses to that, sir. One would be that I think if you ask the Union Carbide representatives later in the hearing today, I think you will find they consider that quite a serious penalty.

Further, that is the maximum available to us under the Act for the violation, for a violation that will be characterized as willful. The act limits such penalties to $10,000. We found three willful violations as a result of our investigation, and each of those was cited at the maximum amount.

Mr. CHANDER. Did you say in your testimony how long you think the wall-to-wall inspection will take?

Mr. TYSON. We anticipate, although I can't say it with certainty, because we'll know more after we get into it, but right now, we are looking at approximately 5 months to complete the wall-to-wall inspection.

Mr. CHANDER. With the MIC facility, that is the only one in the country, but how many of this—you did very well at pronouncing that, I had never even heard of it, but how many of those are there in the country?

Mr. TYSON. Well, there are literally thousands of different chemical processes involved, but with those with respect to MIC, this is it.

Mr. CHANDER. The aldicarb?

Mr. TYSON. The aldicarb unit, I think, is primarily used by Union Carbide in the production of Temik, and I am not aware of other chemical companies using that particular substance. We would have to find out and we could submit that for the record. I will not trust my current knowledge on that.

Mr. CHANDER. I think it would be important to know. If you have this potential existing out there in West Virginia, how many others are there.

Mr. TYSON. Yes, sir. I should mention that the aldicarb oxime which was released as a result of this accident is far less toxic and presents far fewer problems than does MIC. Nevertheless, it is an issue we would want to address.

Mr. GAYDOS. Let me, gentlemen, state that in February, OSHA assured the members of this subcommittee that it was virtually impossible for an accident similar to the one in India to occur here in the United States. While the facts indicate that there is a semblance of truth, and while this incident is certainly nowhere near as tragic as the one in Bhopal, India, it does raise many questions about OSHA's credibility.

Now, you have gone through the report, the citations, and I would ask you a couple of practical questions. When you certified that the MIC unit was safe last February, we expected as a committee and the population generally expected, and assumed, that such assurance would extend to the rest of the Union Carbide facilities in Institute.

Apparently, it hasn't.

Mr. TYSON. Our investigation clearly was limited only to the MIC unit, and we did so as a result of the tragedy in India and the concern that we had, and I think that the general public had about MIC in this country. We had inspected not only the Institute plant, but also every other plant in the country where MIC was used in any substantial quantity.

We did not at that time look at other parts of the plant. We are now, and one of the reasons for that, Mr. Chairman, was that we were looking at this whole issue from a different perspective than OSHA has looked at such things in the past.

The tragedy in India and the resulting investigations that we conducted of MIC operations was a different type of investigation than OSHA usually uses. OSHA, when it does an industrial hygiene inspection, and we have done many, many in the chemical industry, traditionally looks at overexposures to particular toxic substances.

We will do air and personal sampling to determine whether or not those exposures are taking place. What we are doing here with the MIC operation and what we are doing now with the aldicarb unit and the rest of the plant is looking at the whole process to determine whether or not the design is adequate, and whether or not the procedures are adequate to insure that a spill does not take place.

Mr. GAYDOS. If I may interrupt you, what other chemicals are being handled presently by this plant?

Mr. TYSON. One that we are going to be looking at very shortly is phosgene which is also a highly toxic substance.

Mr. GAYDOS. And have you looked at it at all?

Mr. TYSON. We have been out there on a couple of complaint inspections, but we have not done the kind of thorough review that we intend to do now as part of the wall-to-wall.

Mr. GAYDOS. What are you going to do, take each element, and then when something occurs, then take a look at it? Is that what you are going to do?

Mr. TYSON. No, sir.

Mr. GAYDOS. Apparently it indicates that is what you have been doing. You have the specific complaint, and you do an investigation. The public is not going to stand for that.

Mr. TYSON. It concerns me too, Mr. Chairman, and that is the reason we have changed our approach.

Mr. GAYDOS. In your explanation, I'm getting a little irritated. I'm going to be very frank with you. You may think your explanation is plausible, but believe me, it is not very practical.

You sat there, and I would not say positively, but I would say in very assertive and affirmative tones, concluded this was a safe plant. Now you are talking about phosgene. What else do they make down there?

Mr. TYSON. We can get a complete list for the committee.

Mr. GAYDOS. Well, what do you think they do? Do you know? If you do not know, can you tell me where we go to get the information?

Mr. TYSON. We do know, but I do not personally.

Mr. GAYDOS. Now you are talking about phosgene. What other dangerous chemicals are down there?

Mr. TYSON. I do not personally know, but we do know.

Mr. GAYDOS. That's what you want the record to show?

Mr. TYSON. The record should show the Agency head does not immediately have that information.

Mr. GAYDOS. Let me ask you then, do you think you should know? At this stage of the game, do you think you should know what is going on down there?

Mr. TYSON. Our people do know, Mr. Chairman. We have already received many of the documents the company has with respect to the entire plant in order to begin the wall-to-wall inspection so that we can look at each and every process, so we do know exactly what they are doing down there.

Mr. GAYDOS. I am getting tired. I have been a very patient chairman of this committee. I have been fair. I think we have been overly fair. I have never criticized when criticism was due, because there are many elements involved, the unemployment problem for example. We have members from areas down there that need Institute's activity. We have been fair, and we have been very restrained.

I am going to tell you something. It is going to come to a screeching halt. You are not going to come before this committee and give me half-baked answers.

You cannot even tell me as an informed public official, one with grave responsibilities, you cannot tell me as of this time what other chemicals are in use or being manufactured or handled down there. Do you think I am unreasonable in voicing grave concern?

Mr. TYSON. Mr. Chairman, the inspection team that is involved with the wall-to-wall inspection knows exactly which chemicals are in use down there.

Mr. GAYDOS. You came before this committee. You could expect a simple inquiry along those lines. What else is happening at Institute? That is a simple inquiry. You should be prepared.

Mr. TYSON. We will make that information available to the committee.

Mr. GAYDOS. Let me ask some specific questions so that the record can be clear. I recall last February that Mr. Miles said in testimony that OSHA was reviewing its procedure for inspections in the chemical industry. That was a general assertion, right?

Mr. TYSON. Yes, sir.

Mr. GAYDOS. Today, you talk about a pilot program scheduled to begin shortly. It took a long time to conceive the program, and granted, it took time to put the program together. Just exactly what do you expect this special program to do, when is it to start, what is it going to be directed at?

I think those are reasonable questions that I should ask you, as a committee chairman, a very patient one over the years.

Mr. TYSON. I will first concur with the chairman's characterization of his committee as being patient, and I appreciate that.

The chemical industry special emphasis program will start with the calendar year 1986.

Mr. GAYDOS. Next year?

Mr. TYSON. It will be beginning in January of next year. We have been working with the Environmental Protection Agency to develop a list of the most toxic substances.

Mr. GAYDOS. Are we still on that kick? Are we still trying to get lists of the most toxic substances?

Mr. TYSON. There are a great deal of different lists. We are trying to develop the best list, and from that list, we will then determine where those substances are used in great quantities, and use that to target particular establishments to conduct inspections in.

Mr. GAYDOS. I am sorry, I was just philosophizing here with my colleague. Go ahead. You've got this long new list that has been 15 years in the making. Now we have got this list.

Mr. TYSON. We have a number of lists, and we put those lists out for comment, and the result has been that there were serious problems that were not included in the list, and some substances included in the list which really did not need to be there.

So I think it is important that we do have a good targeting system to get us to the places where the potential for the greatest harm exists, and that is what the develop- ment of the list is all about, and we have been working closely with EPA with respect to their Toxic Substance Control Act administration in development of that list. We have also talked to the World Bank, and gotten a list from them, and a host of other groups that have put together information with respect to this issue.

The pilot program will involve eight different area offices, and we anticipate we will be doing 80 inspections during the calendar year of 1986.

Mr. GAYDOS. Did you mention the World Bank?

Mr. TYSON. Yes, sir, I did.

Mr. GAYDOS. How does that fit in?

Mr. TYSON. The World Bank developed a list of what they considered to be very hazardous substances.

Mr. GAYDOS. The World Bank?

Mr. TYSON. Because they insure loans to build establishments, chemical plants and others.

Mr. GAYDOS. So you are going around trying to squeeze some information for OSHA

Mr. TYSON. Mr. Chairman, we have been trying to get information from everybody that we could.

Mr. GAYDOS. As a passing comment, let me say this: I do not think it is beyond the realm of possibility, that should a catastropher occur, there could be some public officials that would be subject to some suit.

We knew that there were criminal sanctions in the act. None of it pertains to public officials per se, but under the act there are criminal sanctions. There has been recently an illustration of that in the newspaper.

Now this thing has been going on so long, and the information is so sketchy at this late date, I mean we don't even have a list of dangerous chemicals. I don't profess to be that well informed a lawyer, but I am suggesting that there could be grave implications should a national tragedy occur involving thousands of people and lives. It is not going to be just money damages, and I would hate to see that occur.

Let me get some practical questions answered. What is the Agency doing in the meantime until we get this special program, and how many chemical plants have been inspected since last February?

Mr. TYSON. The type of inspection activity that we did at the MIC?

Mr. GAYDOS. Real, imagined——

Mr. TYSON. The five that produced MIC and this aldicarb oxime.

Mr. GAYDOS. How about chemical plants generally? How many chemical plants generally do we have in the country?

Mr. TYSON. In the country, we have some 11,000, Mr. Chairman. We conducted 15,000 inspections of those last year—excuse me, 1,500.

Mr. GAYDOS. Let me ask you something. Now in that number, and I want to be specific about this, in that number of inspections there are many instances where an inspector goes in, takes a look at the record, lost time accidents, lost wages, because that is included, and there is no inplant wall-to-wall inspection. Those include many, many areas where there are inspections by numbers.

Mr. TYSON. Some of that 1,500 were wall-to-wall. Some were limited to the area they complained about.

Mr. GAYDOS. You cannot answer how many were wall-to-wall?

Mr. TYSON. We sure can get it for you, but I cannot tell you there were no records checks.

Mr. GAYDOS. Besides the five that you mentioned.

Mr. TYSON. Those five were not wall-to-wall. Those five were limited to the MIC operation.

Mr. GAYDOS. We have had accusations that these inspections were a farce in many instances. Whether that is true or not is not to be answered by the committee, but I do want to put on record my vital concern that in some of these inspections as soon as the lost time accidents are examined, that is the end of the inspection. Many times a very small portion of a production facility or a plant is inspected, and it goes down as an inspection.

Now, in this new procedure you are setting up, are the inspections going to go above and farther than the past inspections meaning they will be along the lines of wall-to-wall or more inclusive?

Mr. TYSON. Let me first respond to an initial point, and that is that of the 1,500 inspections that OSHA made of chemical plants, none of those were the type of records check where we just look at paper, none of those. These inspections result from the health targeting system which does not involve a check of the employer's records. That records check policy involves safety only.

Mr. GAYDOS. Explain to the committee just exactly what form these inspections did take.

Mr. TYSON. Yes, and we can give you a complete breakdown of the type of each of those inspections.

[The information follows:]

OSHA (Federal and State) conducted 2148 enforcement visits in the chemical industry (SIC 2800-2899) in FY 1984. Since there are approximately 11,000 establishments in the chemical industry, OSHA inspected approximately one in every five chemical plants that year.

OSHA Inspections in the Chemical Industry, FY 1984

Total		2148
State[*]		907
Federal		1241
Comprehensive		516
Partial		394
Health		495
Comprehensive	284	
Partial	211	
Safety		746
Comprehensive	232	
Partial	183	
Records	331	

---

[*] State inspection data are not yet fully integrated into OSHA's computerized data system and so cannot be broken down into subcategories as can the Federal data.

Mr. TYSON. But beyond that, to answer your second question, the type of investigation that we envisioned as a result of this pilot program is a great deal more detailed than the usual inspection that OSHA would make.

OSHA in the past would make an inspection, as I indicated earlier to the committee, where we would either look at a particular mechanical problem or take air samples or personnel samples looking for over-exposures to toxic substances at that time.

What we are going to be doing with this special emphasis program is going far beyond that and looking at the entire process. We will be looking at the design of the system itself, whether or not there are adequate backup systems provided as a part of that design, to insure that if there is a leak that that leak will be properly handled mechanically so that it can vent to a scrubber or to a flare so that there is no release into the atmosphere that might expose employees.

We will also be looking at the emergency response plans so that if there is a spill that is not contained through the mechanical system that there is adequate protection for the employees in the event of such a release.

Mr. GAYDOS. I have heard that itinerary in the past. I have heard that itinerary as related to grain elevators. Let me deviate from the subject matter and just ask you a quick question as far as a grain elevator is concerned, and I will show you why I am asking the question.

What could we have done that is different as far as the grain elevators, as far as the series of explosions that we had? What can we do different on grain elevators? You have answered that. I will tell you why, right back again. It is the same old talk. You are going to do this and do that, and you will come right back to the chemical industry. You are talking about all these high-falutin' procedures and approaches to this subject matter, and 5 years later, you are going to have the same effect.

We did not do anything on the grain elevators, and we had 40 or 50 men killed during those occurrences. Now, here we are back in the chemical industry, same type of approach. We are going to do this, we are going to do that, put this kind of inspection in.

Is that an unfair question?

Mr. TYSON. No, sir, it is not an unfair question, but I disagree with your characterization that nothing has happened as a result of our emphasis on the grain handling industry.

We have had a great deal of impact there. We have had a special emphasis program to further inspect grain handling enterprises for a number of years. Our problem has been with respect to grain handling that we don't have good standards to work with, and we are developing better standards that would apply.

Mr. GAYDOS. Are we going on the standard kick again? Who would be responsible for not having standards? Would NIOSH?

Mr. TYSON. No, you're talking to him. That also is under our jurisdiction.

Mr. GAYDOS. I would hope that there would be some acceleration of the development of the standard. The administration, this one and the previous one, were erroneous, and I think inadequate, in that they did not adopt standards.

Now you are talking about standards again. In the meantime, a catastrophe occurs. Who is going to answer?

Mr. TYSON. A couple of answers to that. As to the standards issue, all I can tell the committee is it is one of the most difficult things we do at OSHA, try to get a standard out. It is a very complex kind of thing, a hard-to-do process, but the fact is that we have been going to these sites. Even though we do not have adequate standards that we can utilize to cite employers, we can still go to the work place, recommend changes where necessary,and utilize the 5(a)(1) provisions where we can under the law. We can still make the employer effect some changes that will prevent the explosions, and I think the record speaks for itself in that the number of these explosions has been down dramatically.

Mr. GAYDOS. Now, I am going to call you back. If we get a series of them, I am going to ask you how you are going to explain the series of explosions. You know that we have atmospheric elements involved, and that they do occur in a series.

They have not been as catastrophic as they have in the past, but you have not given me an answer on record as to what you require now that is different from last time as far as the grain elevator is concerned.

I submit to you you have done nothing. We will consider that another day, and we will get back on this. It would be confusing to make a comparison.

Specifically, when was the last time prior to August 11 that the aldicarb oxime unit of Union Carbide was given a full inspection by OSHA and, what was the result of any such inspection, if any were made?

Did we ever look at that?

Mr. TYSON. The aldicarb unit at the Institute plant is a new unit, Mr. Chairman.

Mr. GAYDOS. How new is it?

Mr. TYSON. That substance was previously produced at the Woodbine plant in Georgia which we did review in detail. We did a wall-to-wall of the Woodbine plant.

Mr. GAYDOS. When did you do that?

Mr. TYSON. Right after the Bhopal incident when we were looking at the MIC operations.

Mr. GAYDOS. And you say you did an inspection out there?

Mr. TYSON. I am sorry, Mr. Chairman. We did do a wall-to-wall of the entire plant at Woodbine, Georgia, which covered not only the MIC operation——

Mr. GAYDOS. I hear that term, wall-to-wall. How inclusive is a wall-to-wall? Does it go wall-to-wall because a man can walk fast, or is it done specifically item by item or procedure by procedure?

Wall-to-wall can mean many things. What is a wall-to-wall?

Mr. TYSON. In our terminology, a wall-to-wall inspection is a complete inspection of every part of the facility, not just simply a walk through every part of it, but a look at each and every process and potential hazard that may exist within the walls of that plant.

Mr. GAYDOS. All right. They did one down in Georgia?

Mr. TYSON. Yes, sir.

Mr. GAYDOS. How long ago was that?

Mr. TYSON. That was September 1983.

Mr. Gaydos. When was the new procedure instituted up here at Institute?

Mr. Tyson. I am sorry. The September 1983 was when the aldicarb unit moved to Institute, September 1983.

Mr. Gaydos. 1982 or 1983?

Mr. Tyson. 1983. That time frame is not right. The inspection in Georgia was in February of last year, and it was sometime between then and now that the aldicarb unit moved to Institute.

Mr. Gaydos. Are you sure of that?

Mr. Tyson. Yes, sir.

Mr. Gaydos. How would you know?

Mr. Tyson. We have looked at all of the company records.

Mr. Gaydos. You do not keep track of what the internal workings of a company is or are. How would you know this?

Mr. Tyson. We would not ordinarily know that, Mr. Chairman, but as a result——

Mr. Gaydos. If you had an inspection, you would know as far as that particular procedure.

Mr. Tyson. That is how we do know, because we did inspect at the Institute plant, and as a result of the inspection coming from the accident, we looked at the history of the whole unit, and that is when we determined when that unit was transferred up from the operation down in Woodbine.

Mr. Gaydos. Mr. Chandler wishes to ask a question so I will yield to him, but I will get you back again.

Mr. Tyson. Fair enough.

Mr. Chandler. Actually I am concerned about the patient's blood pressure here. Mr. Tyson, how many total inspectors do you have available to you at OSHA?

Mr. Tyson. We have allocations for 1,200 inspectors, federally. There are another 1,000 to 1,200 that are in State plans. Of those Federal positions, we fill roughly 1,000 to 1,100 at any one given point because of the attrition rate and the time it takes to fill those slots.

Mr. Chandler. How many do you have right now?

Mr. Tyson. The exact number, I think, is about 1,049, pretty close to that.

Mr. Chandler. So if you assume you have got roughly 1,100 in OSHA, 1,100 in the State plans, you have got 2,200 inspectors for the entire United States. You have 11,000 chemical plants alone, God only knows how many grain elevators, how many fireworks plants, how many construction sites, or any other production process.

When the Congress of the United States set up OSHA, they obviously wanted to make for a safer workplace, and as I sit here and listen to the chairman express his very legitimate concerns and, your, I think, very candid answers, it occurs to me that a very fundamental question has to be asked, what do we expect you to do. There is no way you can get around to 11,000 chemical plants every year, probably not even every 5 years, let alone know that they have moved some part of their production from Woodbine, GA, up to Institute, WV.

Are we simply going to have to say we are going to be, in essence ambulance chasers and go to the site where there has been an accident, try to find out what happened, create some standard to try to protect us from it in the future, and then continue spot investigations, or are we going to say 2,200 people is not enough we have got to expand that force and try to do far more spot and wall-to-wall investigations with the hope that we can catch those things.

Have you thought about this?

Mr. TYSON. Oh, yes, sir.

Mr. CHANDLER. Do you have a recommendation for the Congress of how many inspectors you would need if we expected you to anticipate and find the kind of problem that existed at Institute, how many thousands of inspectors you would need, do you have that ready for us?

Mr. TYSON. We could produce that, Congressman, but basically, we need to look at the whole theory behind OSHA, and the chairman was a part of the drafting of the legislation and can speak to this probably better than I, but OSHA was never envisioned to be a universal coverage in that we were going to inspect every plant, every year. The most that we could ever expect to do, and the intent was to do a spot check that would cover a substantial portion of the industry with a focus on those industries that are most hazardous, and as a result of that information percolating through the other workplaces and through the result of other OSHA activities and the consultation, training, education activities, impact the workplaces and effect change.

I think our record speaks that we have been able to do that with the existing level of resources. The number of people hurt in this country by the most recent evidence available to us which is BLS data for 1983 shows that there were fewer people hurt on the job in 1983 than any previous year during a period of time when there were more people working than have ever been working before in this country.

So I think OSHA's track record is pretty good. It is always easy to say if you had more resources, but at some point, there always has to be a balance between the resources that would be utilitized in an OSHA inspection and those that might be utilized in other serious areas that deserve funding from the U.S. Government, and there is a dynamic to that that I will not attempt to try to get into right now.

But, basically, we have been able to inspect about one out of every five chemical companies in any 1 year during OSHA's previous history. We have tried to focus our resources in those places where we can do the most good.

The whole issue that we are faced with here is a relatively new one in the sense that it was brought to our attention dramatically by the results of the tragedy in India, in Bhopal. OSHA has attempted to react to that which I think is the proper course for a public agency in our posture to do.

We are not going to stand up before, and I am not going to stand up before you today and say that the approach that we are trying to take right this minute is going to be the ultimate answer.

It may be that this is not going to be successful in bringing about the kind of change that we think may be necessary, but it is the best approach that we can come up with using the collective minds and expertise that we've got within the agency now. So I think I can share the frustration that the chairman may have with the time it takes to change direction within the agency and focus on new issues,but I think that we have got 2,000 safety and health professionals within the agency, and I think they are more than competent to handle that kind of a task.

Mr. **Chandler**. If I may just continue?

Mr. **Gaydos**. Sure, go ahead.

Mr. **Chandler**. Really to make a statement. I think that is an excellent answer to a difficult question, and I agree with the chairman. He is a patient man, and I have enjoyed working with him. He is not a rebel rouser in here doing what could be a lot of mischief.

But, I do think that if we were to suggest to the other Members of the U.S. Congress that we create an OSHA which could anticipate even a half of what would be the potential accidents out there, there is no way that they would be willing to pay for it because it would simply be too costly.

I think we just have to be honest with ourselves, and say that unfortunately there will be accidents that will happen in the work places, and the U.S. Government or anybody else is not going to have sufficient resources to go out and protect ourselves from it.

Then I think, we ask ourselves what can we do in the way of creating standards for the work place. Do we need to take this section of the law which provides for the penalty, limit of $10,000 per violation, increase that, those kinds of questions.

I think that is what we need to focus on. I really appreciate your letting me come back to the questions, Mr. Chairman.

Mr. **Gaydos**. Any time. Let me suggest that the Mine Safety Act was a result of some severe accidents that occurred in large numbers, such as 120 killed at one time. If a catastrophe occurs as occurred in India, it could take any form, be in any geographical location in the country, and someone is going to be called to answer.

We say we have an insufficient number of inspectors. I think that is fundamental. We know we do, but there has always been a question as to how you utilize what you have, and this administration is determined that its utilization depends upon lost work records and things of that nature. That is going to have to be addressed, and the administration is going to have to answer if that type of a catastrophe occurs. I say again, I hope it does not occur, but here in the past few weeks following the August 11th accident, there was a string of other incidents in this country that I am sure you are familiar with. I would give you some examples: an ammonia leak at the Olin Corp. plant in South Charleston; a chemical leak in Westchester, PA; a chlorine leak at Champaign Paper Mill in Canton, NC, and so many others. That is just a few I am referring to.

I have to ask you as a matter of record, is OSHA in your estimation responding sufficiently to these other incidents, and are you planning full inspections of those plants also as you are in this area, and given the number of inspections you cited in your statement, doesn't this raise some questions about OSHA's inspection procedures and policies, especially the part about voluntary compliance?

Those are hard questions, and you are going to have to answer them. The responsibility lies with you. We have passed the legislation. The implementation, the funding, you know, all those things are other issues, but before you answer those questions, I have got to conclude in the last 4 or 5 years, I have never, ever heard of any present administration personnel, regardless of what standing they have, the Secretary on down, asking or demanding increases in the budget.

They always acquiesce, always find reasons and end up supporting the budget request. Here you are, I think, you are in contradiction to the status or the standing or position of the administration, because you are saying you need more personnel. That has not been the case when it comes down to budget cutting time. There has never been a formal request and an outcry that the budget is insufficient. There has always been mysterious agreement.

Maybe you can address yourself to those questions that I have asked you so the record will be clear.

Mr. TYSON. Let me address as well as I can remember those in the order that you asked them.

First, every chemical spill that comes to OSHA's attention comes to my desk. I get a report on it, and we send an inspector out as quickly as possible.

Mr. GAYDOS. You will be the man then if something occurs.

Mr. TYSON. I will be the man, yes, sir.

Mr. GAYDOS. On your desk.

Mr. TYSON. And we send an inspector out to find out what happened, to conduct an investigation and issue citations, if appropriate. That, to me, is not the approach that OSHA ought to take, and it reflects back to what Congressman Chandler mentioned earlier. We do not need to be in the leak chasing business. We ought to be in the leak preventing business, and we need to find out the best way we can get into that business.

One of the approaches that we are utilizing is the special emphasis program that I talked about earlier today, but that is not going to be the only approach that we take. Obviously, we have to use all of the tools that you in your wisdom have given to us here in the Congress to try to effect change in the work place, and that is well beyond just the enforcement aspects of the act.

Clearly, you have to have that club available and utilize it when necessary, but you can effect change through other ways, the training programs that we have available, the grant programs that we have available to train employees, the standards development program, the whole array of things that we can do—the whole arsenal. We have got to try to get chemical companies to comply with changes that they need to make.

We reward those companies that are doing a good job. We have got a voluntary protection program where we recognize such companies. Chemical companies actually make up a major number of our VPP participants, in that they are doing an excellent job of addressing this type of issue.

It seems to me that we need to be looking at it from a much broader perspective than simply the idea of trying to find out where the latest leak took place and running out with an inspector out there to find out what went wrong, because every leak that takes place is a failure on our part to make sure that it did not happen in the first place.

The resource issue is an extremely difficult one. I cannot stand up here before the committee and tell you that if you gave me another 1,000 inspectors that I would not be able to utilize them, but that is a balance that I am not allowed to make, nor are you. It is an issue that requires a dynamic of a number of different parties to the issue, and there are different factors, well beyond the issue before us today in OSHA that would have to be weighed in making that kind of determination. I won't presume to make it myself.

Mr. Gaydos. Mr. Chandler.

Mr. Chandler. I was just going to ask Mr. Tyson under that penalty section, if this is a willfully or repeated violation penalty that you cited, the $10,000, do you think that is too low? Should the Congress give you authority to assess a higher penalty?

Mr. Tyson. In my professional judgment, and let me speak personally, because I have been in OSHA for a number of years and have been around OSHA for 13 years, I have not see that the dollar amount of the penalty was really the issue. I am not so sure that it would make any difference to Union Carbide if that penalty was $10,000 or $100,000. The fact that OSHA came out and found a violation and is requiring the correction to that violation is usually the key to the enforcement program, not that dollar amount.

The dollar amount clearly gets the attention of the press and the media, but I am not sure that is the most effective approach and the best answer to the issue. I can only speak for myself.

Mr. Gaydos. Are you suggesting then that the amount not be disturbed or changed?

Mr. Tyson. Mr. Chairman, I hate to open up the Act in anyway, and I think in the past, you have shared that concern. I think it is a good piece of legislation. It gives us lots of tools to utilize, and we are trying to utilize those tools now.

Mr. Gaydos. Does OSHA have any opinion, and think about this before you answer, as to those recent exposures of the individuals, involved workers on the job, and indirectly some of the other residents, will there be any future health problems? Have you gone into that?

Mr. Tyson. Yes, sir, we have looked at that. The information available to us now is that we do not believe that there will be future health problems with respect to those one-time exposures. The information that we have available to us now, and it is always limited, and you always wish you had more, but the information available to us now indicates that while some of those substances have been shown to be hazardous in long term exposures over some period of time and at certain levels, a one-time exposure such as has occurred here in the Institute situation, we do not believe has the potential for causing grave concern on the part of those people that were exposed.

No one wants to be exposed. I would not want to be, and I am sure you would not want to be, but in terms of a concern about long term health effects, right now, the data would indicate that there need not be a great deal of concern.

Mr. Gaydos. I do not want to be a soothsayer, but do you think you are going to be called back before the committee in the next couple of months, two or three months, for another occurrence of this type?

Mr. TYSON. Mr. Chairman, I will be here whenever you ask me to come.

Mr. GAYDOS. When you come, bring your facts with you, and I do hope that we do not have to have you back. Anything else to say to the committee? I think I glean from what you have said that, number one, you do not want the act changed. You think the fines are sufficient, and you conclude you are working very, very hard at putting a new procedure in place, and expect good things to come from that, is that right?

Mr. TYSON. And I would add to that that I expect good things to come from it. If I could regress a moment, in the discussion of the whole issue of leaks in this respect, a lot of attention is being paid to leaks and spills in the chemical industry now as a result of Bhopal.

The challenge for us, among many others, is to determine whether or not this phenomenon is simply a result of the increased attention paid to leaks, or whether or not we are, in fact, having more leaks. We are going to have to find the answer to that question before we can figure out the best approach to solving the problem.

I suspect it is a combination of both. As we go through this program and evaluate the results of it, we will be able to make that determination much more accurately.

Mr. GAYDOS. Unless I miss my guess, you can almost presume, and I think accurately so, that all these things have been occurring in large numbers, and most have not been reported. They have been covered up. I cite for my authority the substantiating evidence of other witnesses. We are going to have some coming up. I know if I ask the question, there will be the response that many of them have not been reported in, but covered up.

Mr. TYSON. You may well be correct, sir.

Mr. GAYDOS. And counsel suggests that probably a lot of them are so small is that is probably why they are not being reported, and that is human nature again. That is the way the operation has been.

I just cannot envision this country over the 200 years of its existence having operated so effectively in international trade, international productivity of all types of things, not having an OSHA Act of some sort. That belays any type of explanation. That is why I have that sensitivity and affinity for this act. Along the line, somebody, somewhere, somehow has to put some order to this position, and companies, our industrial might in this country, have to conclude that good intelligent rules, safety rules are good business. I don't know whether we are doing it or not, but those are the things that are so sensitive and illusive at this time.

Mr. TYSON. Mr. Chairman, I could not agree more.

Mr. GAYDOS. I want to thank you for coming before the committee. On those statistics you promised, I know your promises are good. They have been in the past. Sometimes your judgment is not what we think it should be, but please make those facts available. We would appreciate it.

Mr. TYSON. I would be happy to, and thank you.

Mr. GAYDOS. I hope not to have you back for awhile.

Mr. **Tyson**. Perhaps you can invite us back to talk about the success that we have with the program.

Mr. **Gaydos**. We will do that too. Thank you very much.

Mr. **Tyson**. Thank you, Mr. Chairman.

Mr. **Gaydos**. The Chair calls Mr. George Robinson, health and safety department; Mr. Joseph Gresham, business representative, local lodge 656, Machinists and Aerospace Workers.

It is nice seeing you again. If you have a formal statement, we will accept it, and put it in the record. If not, you can proceed, and make comments, if you wish, on the testimony given by the prior gentleman.

STATEMENT OF GEORGE ROBINSON, DIRECTOR, HEALTH AND SAFETY DEPARTMENT, INTERNATIONAL ASSOCIATION OF MACHINISTS AND AEROSPACE WORKERS, ACCOMPANIED BY JOSEPH GRESHAM, BUSINESS REPRESENTATIVE, LOCAL LODGE 656, INSTITUTE

Mr. **Robinson**. Mr. Chairman, neither Mr. Gresham nor I have prepared written statement today. I would just have very brief comments before introducing Joe Gresham who is our business representative and carries the responsibility for the care of all the IAM members down in Institute, WV.

My concern, of course, comes from testimony back in December 1984, and then again later on with Joe Gresham here, I believe in January 1985. That testimony at the behest of the committee, talking about Bhopal and the incident there, and our concern then that OSHA had really failed us by not really inspecting adequately plants, namely, in this case even in the Institute plant for a long period of time.

We felt that their attitude of using injuries and lost time accidents as a vehicle to decide whether a plant was dangerous or not was foolish, and I think now more than ever, it shows.

When we left after our last testimony, we were made aware or at least thought that OSHA was doing a total wall-to-wall inspection of that plant, and we were at least satisfied that experts were going to review the practices that were going on in that plant, and we would have a absolutely safe plant.

I am sorry to say that apparently it did not take place, and it bothers us because, first of all, we have had a good employer/union relationship down there with the company. I did not come here to sand bag them. They pay good wages. We have good jobs, and we do not want to lose them, and if accidents like this continue to happen, no employer can stay in business in this kind of situation.

So we have a lot to lose. We do not want to lose the plant, and yet we asked the committee, we asked OSHA to come out and really do the jobs we think they should be doing.

When they talk about 11,000 chemical plants, there is only one plant in the United States that I know that manufactures MIC, and Mr. Gresham, of course, is an expert on the plant, but I know there are many other dangerous chemicals in that plant that can be very hazardous to the community.

So it needs the expertise of OSHA, and I hate to see the turkey, as we say, popped in Pat Tyson's pocket, because even though I do not know him personally, I am aware that he has been a good servant. Of the previous two persons that were given the responsibility by the Secretary for OSHA, I would have less than nice things to say about in carrying out the responsibility that the Congress gave them. So, Mr. Chairman, we are delighted to be here. I did not come here to be critical of the company. If I had anything to be critical of, I would be critical of OSHA, over and over again, for failing to carry out its responsibilities and letting all of us down.

Of course, the future holds possibly a terribly terrifying accident if they do not do something about it. Mr. Chairman, that is all I have to say, and with that, Mr. Joe Gresham is prepared to answer any questions, or we are together.

Mr. GAYDOS. Joe, you are an old hand before the committee. Could you put your statement on the record?

Mr. GRESHAM. Well, I did not prepare a statement. I was told that you had some questions concerning the testimony I gave in February.

Mr. GAYDOS. You were pretty positive then, you remember?

Mr. GRESHAM. Right.

Mr. GAYDOS. Darned positive. In fact, we had one of your Congressmen from West Virginia up here at that time. I think it was Wise?

Mr. GRESHAM. Bob Wise, Congressman Wise.

Mr. GAYDOS. It was actually in December.

Mr. GRESHAM. Concerning the MIC, of course, you know you found out that they went in, they upgraded the safety procedures, upgraded the scrubbers and things like this. Then we had the leak that happened August 11.

The people in the plant continue to hand in what we call our adverse condition reports, and our safety first committee investigates those. Now, the problem that Mr. Robinson was talking about OSHA, here recently we have had two decisions come back from OSHA. One was concerning asbestos in our plant, and, of course, there was no citation.

We continue to file claims, you know, and Worker's Compensation in our State for the diagnosis of asbestos. This is a big problem, a health problem, and I am sure you are aware of that, and that is the one that we are addressing with our people.

Chemicals, there are toxic chemicals there in the Institute plant. Hopefully, whenever Carbide says this is how we want you people to handle this, the Federal agencies have looked at that procedure and said, yes, that is the best way it can be handled safely, you go ahead and go with that procedure. Now, I do not think that that has ever been done before until here recently with the Bhopal incident in December of last year.

So our safety first committee has made some grounds in past negotiations that we have had with Carbide in April of this year. We have got some new information that we have never been able to get before through negotiations that is in our contract now, and I think we are striving a little better.

We had a good relationship. We still have a good relationship with Carbide as far as safety and health. We have our problems, but we are trying to take care of those problems. When our people come to us with a problem, then we go right to our safety first committee, and, of course, if we cannot get it there, then we would go to OSHA or NIOSH to come in and make an inspection.

There was an inspection right after August 11 of another part of the plant. I believe it was in the lab facilities. That closing conference on that has not come out of OSHA yet, so I do not know if there are citations there.

The other citation that we were asserted party status came back and OSHA dropped those charges. I just found that out yesterday morning. I did not get to see the copy of the OSHA report, because I was in transit coming here when I was told yesterday morning about the citation, so I have not read the completed report until I go back home today.

If you have any questions, I will be glad to answer them to the best of my ability.

Mr. **Gaydos**. Joe, let me ask you this, and let me just say this. The committee is personally cognizant of the *Johns Manville* case, how that company was almost destroyed, and whether they caused it or not is debatable.

The fact remains that where we have Union Carbide with that incident in India, and the whole corporate structure in jeopardy, we can understand, and I understand, I am sure the committee does, the ramifications of the great number of law suits that are following and the potential incubating right now at this time, and the possibility of a sole source of livelihood being deprived of many, many people down in that particular area. I understand that.

The committee also, I think, is very cognizant of the reluctancy of employees—which we have experienced here on the committee—such as the miners all over the country, actually refusing to submit to an x ray because of their inherent fear that the x ray would show that they have a touch of black lung and they would have to leave their job.

Then we had to devise some kind of methodology to take them from that job and put them in another job. Then we had to go to the comparable pay scale, and we had a lot of problems with it. So I understand why many employees would cover up, not report, you know, spills, small spills, insignificant spills, et cetera.

Let me ask you, as a union man all these years, and an employee, and without putting you on the spot, without going into specifics, generally, has the situation at Union Carbide been one which relieves your conscience in that it was being done in the best possible way insofar as the procedures, and the work place was as safe as it feasibly could be made safe given the knowledge we have?

What generally is the situation there from the inside out, because the committee cannot get in there. Experts do not know what they are talking about half the time. All they can do is apply the facts and apply some very high falutin' principles that are debatable and reach a conclusion, and they call it expert. We all know that. What is going on inside the plant?

Mr. **Gresham**. To answer your question, generally yes, the safety and health is a big step. It always has been.

Mr. **Gaydos**. Let me ask one question. There were four or five respirators at the time of this incident. There should have been more. Did you notice that? Did anybody notice it? Was it accidental? Could they get at them? What is the story there? Is there a safety committee in-house?

Mr. GRESHAM. Right, our safety first committee went over there, and the masks that they were talking about were in another room. There were two rooms, and of course, air-conditioning brought the smoke in.

Mr. GAYDOS. A reversal, almost like, wasn't it?

Mr. GRESHAM. Right, the safety first committee has always went to Carbide and asked them for pressurized control rooms, but I guess for the expense it would cost a pressurized control room, it was not justifiable. In other words, nothing could get in if it all was contained in one building. The air was not brought from outside, you understand.

They did not have that. Now, I do not know what they have done with the air-conditioning system. I think they are looking at it, but the safety first health committee, when they went in with the investigation, brought in more safety equiment as far as Scott air packs, 30-minute Scott air packs. You put them on your back. Those are in the control room proper now. They are still back in the other room. There are extra ones there. We asked to have more air equipment in the control room, because usually that is where the men come through and go out.

The air-conditioning, I do not know how they are going to address that yet. The alarm systems, our people filed what we call the HCR, hazardous condition report, on some alarms, previous before August 11. I forget the day, but I think it was in May or June, and they were labeled what they call nuisance alarms. That piece of equipment is out of service so a liquid level might come in or a high pressure might come in. The operator knows the equipment is out of service so he does not really look at it.

That is where the communication gap happened. Whenever they put material in that tank, the operator did not see the alarm and did not react to it. We were told that the nuisance alarms were going to be taken care of. Now whether they were or were not, I do not know, because the HCR we got back did not tell us what type of corrective action was taken at that time, but they said they took care of the alarms.

So we went in and we did just what you said. We did not have enough Scott air packs. We did not have enough fresh air equipment. Now we do.

The safety first committee has went and looked in other units in the plant to make sure that they have enough Scott air packs and fresh air. We are also looking, the safety first committee is looking at what they call hazardous material suits that are disposable. We use those to a degree up in the MCB unit which is where aldicarb oxime is at, and the alarvin unit, but the hazardous material uniform is something different. We have not even confronted Union Carbide with that, but they will be getting that in the near future.

But, like you said, if somebody does not come to our safety first committee as far as our members and say, hey, we have got a problem here, then it is hard for them to see that problem unless they are at the spot themselves, because when they see a problem, they bring it up. They meet with the company twice a month.

Mr. GAYDOS. Twice a month?

Mr. Gresham. Right.

Mr. Gaydos. Do you know of any incident that occurred in the past whereby a complaint was made, and the company would arbitrarily say we are not going to consider it? Has that ever occurred, or has there always been a mutual attempt to address the problem and hopefully solve it?

Mr. Gresham. Yes, there has always been an attempt to try to solve it, right.

Mr. Gaydos. Would you then characterize your relationship with the company as being good, relatively good?

Mr. Gresham. It has been good. If we have a problem, if OSHA does not come in, then we have to go to arbitration with it. We would have to file grievances, safety grievances, and we would have to go to arbitration.

Mr. Gaydos. Have you had any major safety grievances in arbitration recently?

Mr. Gresham. No, sir, we have not.

Mr. Gaydos. How about over the past couple of years, if you can remember?

Mr. Gresham. No, sir, not to my knowledge have we had any safety grievances go to arbitration.

Mr. Gaydos. Well, then, it would be safe to conclude that you get along pretty well with management internally?

Mr. Gresham. Right, and when we have a problem, there are other problems, like when I was up here in February, a manpower problem. Of course, that is always going to be a problem, and we are still trying to work something out with Union Carbide on that.

Mr. Gaydos. What about the general employees of the plant, as a group and individually? Are they pretty well satisfied that it is a relatively safe place to work?

Mr. Gresham. I would say yes, because nobody has really come down and told me, hey, it's unsafe. If we have a——

Mr. Gaydos. No situations where something has been left alone that is a bad situation, obviously so, it is aggravated, and yet still nothing is done about it, any of that type of situation?

Mr. Gresham. No, we usually get something done. I mean one way or the other, they usually come up and either quit what they are doing or go to something else.

Mr. Gaydos. How long has the plant been there?

Mr. Gresham. How long has it been there?

Mr. Gaydos. That they have been operating, if you know?

Mr. Gresham. Right offhand, I would say it was the early forties or late thirties, I think.

Mr. Gaydos. OSHA has alleged that management of the plant was aware of certain shortcomings in the aldicarb oxime unit. I understand it was like a new procedure.

Were men who worked in that facility aware of any problems with the equipment or safety systems in existence in that unit?

Mr. Gresham. Other than the alarm systems.

Mr. Gaydos. Other than the alarm?

Mr. Gresham. No, not that I know of, because to my knowledge, most of the men on the shifts did not know that they were using this tank for a storage tank. That is where I think the communication gap happened either between management themselves from a nontechnology to a technology man or whoever, the word just did not get passed on. I just surmise it.

Mr. **Gaydos**. It would be pretty difficult if you put something in a tank, a certain volume, and then removed a certain amount of chemical out of there. Very easily, you could have a residue left in there and nobody know what was in there.

Mr. **Gresham**. Right.

Mr. **Gaydos**. Unless you had some kind of measuring or identifying valve or something.

Mr. **Gresham**. Well, you have an instrument, a level instrument, but usually they are calibrated, and you will have what they call a heel. It will be zero to a hundred, and when it is at zero, that does not necessarily mean it is empty. There could be a heel of a few pounds left in it, a hundred, 200 pounds. When you are pumping something out of a tank like that you usually pump until your pump loses suction, and hopefully that gets everything out. Then some tanks you can purge out. They will blow through the top and out the bottom to make sure they are blowing all the material out of the tank. Now whether that was done there, I do not know.

Mr. **Gaydos**. What about the other operations at Institute. If you want to give an opinion, and you do not have to, should we expect other accidents or leaks? What do you think? What kind of concern do you have, if any?

Mr. **Gresham**. I do have concern that the leak that they had August 11, whether it was given to the public fast enough, I think maybe it should have, but that is just my own opinion. Carbide says they gave 20 minutes after the release, or ten minutes after the release. Our people handled the incident inside the plant super, the way I see it. We had people go in. They had to go in and pull them out of the control room.

The agencies, Federal agencies and State agencies, they were taking care of the people on the outside of the plant. Yes, there's going to be leaks. I cannot sit here and say, no, we will never have another leak at Union Carbide at Institute. I could not say that.

Mr. **Gaydos**. Well, in the Charleston Gazette, you made a statement that you expect leaks in the chemical plant in the future, is that right?

Mr. **Gresham**. Right, equipment failure. Hopefully you can get the equipment and have it replaced before it fails. That is the type of procedures that they have at Carbide to follow up on equipment, maintenance, general maintenance, check it so often. Those guidelines, I would assume that OSHA would make sure that those guidelines and procedures are being done.

Mr. **Gaydos**. You would never accept, would you, a situation where leaks were expected, and if injuries occured, that is how it is?

Mr. **Gresham**. No, no, because if that leak occurs, if our people are trained on what to do when it happens and protect themselves first, then we should not have the injuries.

Now, as far as an explosion or something like this, I do not know how you can protect from explosion. We have had explosions at the Institute plant, I think it was 1952 or 1951. I think it was a tank car that exploded. It burned down a lot of the plant, but nobody was killed. We were very fortunate there. Of course, I was very young at the time.

To say that a Bhopal type incident, and I think that is what you really are looking at, you know, can we have a Bhopal incident. If we had an MIC release, the IAM members that work in that plant who are the operators, who are the maintenance personnel, would not stand by and wait time after time, an hour, 15 minutes, 20 minutes, to stop that release.

They are going to stop the release. Now if it gets out, it is going to get out. If they cannot stop it from getting out, it is going to be out, but they are going to react and try to stop it, so that it will not be a major release where you will kill 2,000 people.

Mr. **Gaydos**. Are you satisfied as an individual that everything within reason and practicality is being done down at the plant to make it a safe and healthful place to work? Would you make that statement? Think about it.

Mr. **Gresham**. Well, yes, I can and no, I cannot.

Mr. **Gaydos**. You sound like the committee.

Mr. **Gresham**. We have been lax. Our people have been lax, you know. That comes with anything, I guess. That is bad, but when you get your finger cut off, you are usually lax in something you are doing, either on a saw or something like this. We have become lax over the years, and this has brought us up on pins and needles.

Our people you know, they are fearful for their own jobs, of course, but they are fearful for the people outside, and they are working on pins and needles. They are afraid they will make a mistake, because everybody is looking right there. I mean, the pressure is on them hard.

What you asked me, I would like to answer that. They are moving more now since the incident on August 11. Union Carbide has really opened up, because they have let us have things we have never had in the past. As I said in the negotiations, we go several, seven or eight things in negotiations of health hazards and material data sheets of chemicals that we never got before. We are getting those now.

Formal safety investigation reports, we never got a copy of those. The weekly injury reports, we never got a copy of those, so we did not know if anybody was getting hurt, because if they wanted to give it to us, they could. If they didn't, they didn't. But they are giving us more information, more than we ever had in the past.

So, yes, to answer your question we are moving and are more safety minded now.

Mr. **Gaydos**. You know, sometimes you try too hard and mistakes occur. It is another thing not to try, so I think your testimony is very important on record in the aspect that changes are occurring.

Do you think your plant is safe generally throughout the other operations, as a general observation?

Mr. **Gresham**. Yes.

Mr. **Gaydos**. You think it is a pretty safe plant?

Mr. **Gresham**. Yes, sir. As a matter of fact, we invited you to come down. I do not know if you got the letter.

Mr. **Gaydos**. I am afraid to come down there, but we probably will be down there sometime.

Mr. GRESHAM. I hope you would come down.

Mr. GAYDOS. We have a schedule here. We are going down to Tulsa, OK, to take a look at the explosion down there where they had those juveniles working in that fireworks plant, and maybe we will put you on the schedule and come down and take a look. We wanted to get down around 3 or 4 months ago. We could not. We have to accommodate certain people on our schedule, but we will be down there, and spend a couple of days down there. I do not know whether it will be beneficial to anybody but we would like to familiarize ourselves with the activities down there. We know the importance down there, No. 1, of the corporate structure to pay Government taxes and to provide jobs. We know the importance to those that have the jobs, yet we know it all must be tempered with the fact that good business is good health and safety. So that is our complex problem.

Do you have anything else to say to the committee?

Mr. GRESHAM. I just hope I answered your questions.

Mr. GAYDOS. I think you have been very forthwith with your responses.

Mr. GRESHAM. When I was up here in February, the answering of my questions concerning MIC, I was not covering anything up. I think that was a kind of implication that some people might have gotten.

Our people, the IAM Local 656, are very safety health conscious people, and we had problems, and hopefully we are taking care of them. We need OSHA, we need NIOSH, and whether making Carbide pay money, if they made some bad judgments as far as design of equipment and how that equipment was going to be worked and produce, then I think OSHA ought to look into those aspects, and I am sure that is what they will do.

Mr. GAYDOS. It is a dangerous business, and you can get into extreme difficulty, financial and otherwise, because of injuries to the general public and to workers, and I think the corporate structure understands that and realizes it.

On the profit motive in this country, in order for the Government to collect taxes, you have got to make money, and we have to have places to work. So if I were to interpret what you said in the last hearing, I would have to say I believed you. I thought you were very forthwith with your responses, and I did not think you were covering anything up. I think you talked as a person who had a long association with these matters, as a leader of men with a responsible position, and what you said, you in good conscience believe, and that is what you experienced. To me, I concluded it is a pretty good place to work, but you are dealing with dangerous chemicals. In the long run, if these precautions are not taken, and changes not made, and safety practices not put in place, the company is going to be a lot worse off financially and otherwise.

Again, it all comes right back to the same situation. Good health and safety is good business. I appreciate your testimony last time, and I want you to know that I conclude it was given in good conscience. It was as accurate and truthful as you could make it.

Mr. GRESHAM. Thank you.

Mr. GAYDOS. I cannot speak for the other committee members, but I am sure they would conclude the same. Nothing else on record? OK, gentlemen, thank you very much for coming. I hope we do not have to have you back again. We will make it a promise, we will try to get down there as soon as we can.

Mr. GRESHAM. We appreciate that. Thank you.

Mr. GAYDOS. The chair would like to call Union Carbide; Mr. Browning, vice president, and Mr. DuPuy, assistant plant manager. I think that is who is scheduled to testify. We have old friends back again.

At the outset, let me say, gentlemen, that we are cognizant of the predicament you are in, and if some of the questions that we ask you contain something that might be detrimental to your future situation as it develops and unravels or however it reveals itself in any future law suits, et cetera, directly or indirectly, do not answer.

We are not here to jeopardize your case, but I would like to ask you to be as specific as you can. Proceed in the manner you wish.

Mr. BROWNING. Very good. Thank you, sir.

STATEMENT OF JACKSON B. BROWNING, VICE PRESIDENT, HEALTH, SAFETY AND ENVIRONMENTAL AFFAIRS, UNION CARBIDE, ACCOMPANIED BY LARRY H. DuPUY, ASSISTANT PLANT MANAGER, INSTITUTE

Mr. BROWNING. Mr. Chairman, the aldicarb oxime incident at Institute, WV, on August 11 was caused by a self-sustaining reaction initiated by the accidental heating of a reactor vessel used for temporary storage.

As a result of this accident, several steps have been taken. One of the first was to temporarily suspend the manufacture of aldicarb solution at the Institute facility in both this operation and the primary aldicarb operation. The latter was not involved in this incident. We also initiated our own internal investigation of the incident, headed by Larry DuPuy, assistant plant manager at Institute, and later, Larry will provide a discussion of the event for you.

In addition, the Union Carbide Corp. Board of Directors' Health, Safety and Environmental Affairs Committee is conducting an independent investigation of the aldicarb oxime incident. The committee is chaired by Russell E. Train, a former EPA Administrator, and now president of World Wildlife Fund-U.S. William D. Ruckelshaus, also a former EPA Administrator, is special counsel to that committee.

This incident has also been the subject of an independent investigation by OSHA and is currently the subject of a request for information from EPA.

As you are aware, shortly after the incident, OSHA announced its intention to further inspect the Institute plant, and we are cooperating with OSHA in its unprecedented wall-to-wall inspection.

We continue to believe, as I stated in my testimony to this subcommittee last February, that our safety procedures for manufacturing, storing and transporting hazardous chemicals are careful and comprehensive. Nevertheless, our efforts to improve these procedures and to insure that these procedures are followed will continue.

Since last December we have checked and doublechecked operations, safety and emergency procedures at our chemical plants. We have redesigned and reengineered certain of our process operations. In doing so, we started with those materials or processes which deal with the most hazardous substances and went down through the list. We have responded to congressional and governmental agency requests for information and have met with local officials and other local leaders to revise and update many emergency response plans and community right-to-know efforts.

We are redoubling our efforts to further reduce emissions through the addition of new resources in people and in capital. We will do this by adding the critical skills and by intelligently organizing the work and spending money on new equipment and new systems.

We have increased our auditing and inspection activities for our chemical plants, and material storage and transfer terminals focusing on hazardous material processes and handling practices.

In addition, a new Corporate Community and Employee Health, Safety and Environmental Protection Department has been established reporting directly to the chairman of the board. This department will coordinate corporate standards for community and employee health, safety, and environmental risk assessment and control. It will assure that policies and procedures are adopted and implemented to further effectuate compliance with applicable legal requirements as well as more stringent corporate standards worldwide. It will monitor and evaluate the performance by operating units against these requirements and standards.

We are committing, as has been announced by our chairman, an additional $100 million to review, design, construct and rearrange operations and facilities to enhance safety and health.

Inventories of hazardous materials have been significantly reduced and in some cases, eliminated. Certain warehouse locations have been or are being consolidated to reduce the handling of hazardous substances.

Throughout the corporation we have striven to speak with the communities around our plants to update them on information and to work on emergency planning.

In the Kanawhy Valley, we have established a new position, director of community awareness and emergency response, to coordinate these types of efforts at our facilities there. The director will be developing an enhanced community outreach program which will provide the public with information on chemicals manufactured or used at our plants.

Also, improvements in local emergency response planning will be sought by combining chemical plant emergency plans with other local planning to achieve an integrated community emergency response plan.

At the direction of Mr. Robert D. Kennedy, the president of the Chemical and Plastics Group, the president of each of our chemical divisions is developing recommendations for additional manpower resources, skills and capital required to further support plant health, safety and environmental affairs efforts.

[The prepared statement of Jackson B. Browning follows:]

PREPARED STATEMENT OF JACKSON B. BROWNING, VICE PRESIDENT, HEALTH, SAFETY AND ENVIRONMENTAL AFFAIRS, UNION CARBIDE CORPORATION

Mr. Chairman, the "aldicarb oxime" incident at Institute, West Virginia on August 11 was caused by a self-sustaining reaction, initiated by the accidental heating of a reactor vessel used for temporary storage.

As a result of this accident, several steps have been taken. One of the first was to temporarily suspended the manufacture of aldicarb solution at the Institute facility in both this operation and the primary aldicarb operation. The latter was not involved in this incident. We also initiated our own internal investigation of the incident, headed by Larry DuPuy, Assistant Plant Manager at Institute. Later, he will provide a discussion of the event.

In addition, the Union Carbide Corporation Board of Directors' Health, Safety and Environmental Affairs Committee is conducting an independent investigation of the aldicarb oxime incident. The committee is chaired by Russell E. Train, former EPA Administrator and now President of World Wildlife Fund-U.S. William D. Ruckelshaus, also a former EPA Administrator, is special counsel to the Committee.

This incident has also been the subject of an independent investigation by OSHA and is currently the subject of a request for information from EPA.

As you are aware, shortly after the incident OSHA announced its intention to further inspect the Institute Plant. We are cooperating with OSHA in its unprecedented "wall-to-wall" inspection.

We continue to believe, as I stated in my testimony to this Subcommittee last February, that our safety procedures for manufacturing, storing and transporting hazardous chemicals are careful and comprehensive. Nevertheless, our efforts to improve these procedures, and to ensure that these procedures are followed, will continue.

Since last December, we have checked and double-checked operations, safety and emergency procedures at our chemical plants. We have redesigned and re-engineered certain of our process operations. In doing so we started with those materials or processes which dealt with the most hazardous substances and went down through the list. We have responded to Congressional and governmental agency requests for information and have met with local officials and other local leaders to revise and update many emergency response plans and community right-to-know efforts.

We're redoubling our efforts to further reduce emissions through the addition of new resources in people and in capital. We will do this by adding the critical skills and by intelligently organizing the work, and spending money on new equipment and new systems.

We have increased our auditing and inspection activities for our chemical plants, and material storage and transfer terminals focusing on hazardous material process and handling practices.

In addition, a new Corporate Community and Employee Health, Safety and Environmental Protection Department has been established, reporting directly to the Chairman of the Board. This department will coordinate corporate standards for community and employee health, safety and environmental risk assessment and control. It will assure that policies and procedures are adopted and implemented to further effectuate complicance with applicable legal requirements as well as more stringent corporate standards worldwide. It will monitor and evaluate the performance by operating units against these requirements and standards.

We are committing an additional $100 million to review, design, construct and rearrange operations and facilities to enhance safety and health.

Inventories of hazardous materials have been significantly reduced and, in some cases, eliminated. Certain warehouse locations have been or are being consolidated to reduce the handling of hazardous substances.

Throughout the Corporation we have striven to speak with the communities around our plants to update them on information and work on emergency planning.

In the Kanawha Valley we have established a new position, Director of Community Awareness and Emergency Response, to coordinate these types of efforts at our facilities there. The director will be developing an enhanced community outreach program which will provide the public with information on chemicals manufactured or used at our plants. Also, improvements in local emergency response planning will be sought by combining chemical plant emergency plans with other local planning to achieve an integrated community emergency response plan.

At the direction of Robert D. Kennedy, President of the Chemical and Plastics Group, the president of each of our chemical divisions is developing recommendations for additional manpower resources, skills and capital required to further support plant health, safety and environmental affairs efforts.

Let me now introduce Larry DuPuy, Assistant Plant Manager at Institute, who will discuss the aldicarb oxime incident of August 11th.

Mr. **Browning**. Let me now introduce Larry DuPuy, assistant plant manager at Institute, who will discuss the aldicarb oxime incident of August 11. Larry.

STATEMENT OF LARRY DuPUY, ASSISTANT PLANT MANAGER, INSTITUTE PLANT, UNION CARBIDE

Mr. **DuPuy**. Mr. Chairman, my name is Larry Dupuy, and I am an Assistant Plant Manager at the Institute plant. I headed the company's investigation team formed August 12 following the aldicarb oxime incident. The team included personnel from both the Institute plant and the Corporation with expertise in engineering, research and development, manufacturing, and health and safety disciplines. We also had on this team an IAM member representing the Institute Safety First and Health Committee.

The objective of this team was to determine the circumstances leading up to the incident on August 11, its cause and what materials were released. Our investigation led to the conclusion that the incident was caused by a self-sustaining reaction initiated by the accidental heating of a reactor vessel used for temporary storage.

Equipment in two systems were involved in the incident, as shown on the diagram attached to my printed statement. The aldicarb reaction system involved was being used for supplemental aldicarb production. Another system, the oxidation reaction system, was available for the manufacture of other products. The key component of the oxidation reaction system is the 5,000 gallon oxidation reactor. A steam jacket surrounds the bottom half of the reactor to supply heat. Emergency pressure relief devices include a rupture disc and a safety valve. These relief devices discharge into a line called the emergency vent header.

The emergency vent header handles these materials by passing them through a scrubber and then to the flare. The gases flow through the emergency vent header into a knockout pot which is a 1,000-gallon vessel intended to separate liquid that might be part of the incoming material.

The liquid accumulated is drained off periodically. The knockout pot has a rupture disc which discharges to the air. Vapors that remain after passing through the knockout pot go into a scrubber.

The scrubber is a 10,000-gallon vessel designed to provide liquid vapor contact with caustic solution or sodium hydroxide, which reacts with and neutralizes these vapors. The vapors that are not reacted in the scrubber pass out the top and flow through a meter to a flare tower. Another vessel in the oxidation reaction system shown in the flow diagram is called a crystallizer. It is a 4,000-gallon stainless steel vessel.

In the aldicarb reaction system, methylene chloride, also known as dichloromethane or DCM, is introduced in specific amounts into the reactor. In the second step a prescribed quantity of aldicarb oxime is introduced.

On August 1, when that step was completed, it was discovered that the meter which measures the introduction of these materials had malfunctioned. The result was that too much aldicarb oxime had been added to the reactor.

Some material had to be removed in order to have the proper proportions of methylene chloride and aldicarb oxime before proceeding to the next step. The oxidation reactor was selected for temporary storage of the excess aldicarb oxime and methylene chloride solution.

To make the aldicarb oxime methylene chloride transfer, copper tubing was installed between the two reactors and the transfer to the oxidation reactor was accomplished early in the morning of August 1.

On August 7, an attempt was made to transfer the aldicarb oxime and methylene chloride in the oxidation reactor back into the aldicarb reactor. The tubing between the two reactors was changed and the transfer was initiated. About 2½ hours after the transfer started, a check by the operators indicated that the transfer had finished. The pump pressure had dropped, and there was no flow through the pump. It was believed at that time that the material had all been transferred out. The oxidation reactor was thought to be empty from that point until the time of the incident.

The first indication of a problem in the unit was a rumbling sound which was heard by an operator. Another operator in the control room looked out the window at the flare tower and observed some smoking at the flare. Almost immediately after that the control room was engulfed in a dense, white opaque cloud.

At 9:26 a.m., an operator turned in the plant gas alarm. By 9:32 a.m., all of the reacting materials had been vented. The five operators and one supervisor elected to remain in the control room until the plant emergency squad arrived, and they arrived at 9:33 a.m.

Six employees were sent to area hospitals for observation. Five were released within 24 hours; however, one employee remained in the hospital for 4 days due to concern about a preexisting medical condition. None of these employees have had any recurring effects from their exposure.

In reconstructing the events, the investigation team determined that approximately 4,000 pounds of aldicarb oxime/methylene chloride mixture remained in the oxidation reactor after the August 7 transfer and that steam was entering the jacket of that reactor through leaking steam valves. As a result, the pressure increased in the oxidation reactor until it forced a safety valve to open, discharging gaseous decomposition products through the emergency vent header into the knockout pot. The flow went through the knockout pot into the scrubber, and any remaining materials flowed to the flare.

This lasted for only a few seconds. The pressure continued to build in the oxidation reactor. The building pressure continued to increase the flow rate out of the safety valve into the emergency vent header until the pressure reached the design setting of the rupture disc on the knockout pot. The rupture disc opened, releasing materials to the atmosphere.

Shortly after that, as the pressure and temperature continued to rise, leakage occurred from three gaskets on top of the oxidation reactor resulting in additional releases to the atmosphere.

From laboratory experiments and computer simulations, we were able to estimate the quantities of materials and where they were released. The initial flow that went through the system all the way to the flare is estimated to be between 100 and 400 pounds. The releases to the atmosphere from the rupture disc on the knockout pot and from the gasket leaks on top of the reactor totaled 3,400 to 3,700 pounds.

Approximately 200 pounds of residues remained in the reactor. Those figures add up to the 4,000 pounds in the oxidation reactor just prior to the release.

In technical terms, the incident was caused by an exothermic decomposition reaction which initiated at approximately 150 degrees centigrade. The heating was caused by the leakage of steam into the jacket of the oxidation reactor.

That concludes our formal statements, Mr. Chairman. We will be pleased to answer your questions.

[The prepared statement of L.H. DuPuy follows:]

PREPARED STATEMENT OF L.H. DUPUY, ASSISTANT PLANT MANAGER, INSTITUTE PLANT

Mr. Chairman, my name is Larry DuPuy, and I am an Assistant Plant Manager at the Institute Plant. I headed the Company's investigation team formed August 12 following the aldicarb oxime incident. The team included personnel from both the Institute plant and the Corporation with expertise in engineering, research and development, manufacturing, and health and safety disciplines. We also had on this team an IAM member representing the Institute Central Safety and Health Committee.

The objective of this team was to determine the circumstances leading up to the August 11th incident, the cause, and what materials were released. During the investigation, over forty interviews were conducted. Physical inspections of the equipment were made to assess damage and evaluate what had happened, laboratory analyses and experiments were conducted, and computer simulations were made to help explain the series of events which occurred. Records were examined, and engineering calculations were made to confirm our findings. Our investigation led to the conclusion that the incident was caused by a self-sustaining reaction initiated by the accidental heating of a reactor vessel used for temporary storage.

Equipment in two systems were involved in the incident, as shown on the attached diagram. The aldicarb reaction system involved was being used for supplemental aldicarb production. Another system, the oxidation reaction system, was available for the manufacture of other products. The key component of the oxidation reaction system is the 5,000 gallon oxidation reactor. A steam jacket surrounds the bottom half of the reactor to supply heat. Emergency pressure relief devices include a rupture disc and a safety valve. These relief devices discharge into a line called the emergency vent header.

The emergency vent header handles these materials by passing them through a scrubber and to the flare. The gases flow through the emergency vent header into a knockout pot. This is a 1,000-gallon vessel intended to separate liquid that might be part of the incoming material. The liquid accumulated is drained off periodically. The knockout pot has a rupture disc which discharges to the air. Vapors that remain after passing through the knockout pot go into a scrubber.

The scrubber is a 10,000 gallon vessel designed to provide liquid vapor contact with caustic solution (sodium hydroxide), which reacts with and neutralizes these vapors. The vapors that are not reacted in the scrubber pass out the top and flow through a meter to a flare tower. Should there be an emergency release, such as a safety valve opening, and the flow increases through the emergency vent header, a rupture disc would open, providing another path of flow through to the flare. At the top of the scrubber there is another rupture disc.

Another vessel in the oxidation reaction system is called a crystallizer. It is a 4,000-gallon stainless steel vessel.

In the aldicarb reaction system, methylene chloride (also known as dichloromethane, or DCM) is introduced in specific amounts into the reactor. In the second step a prescribed quantity of aldicarb oxime is introduced. On August 1 when that step was completed, it was discovered that the meter which measures the introduction of these materials had malfunctioned. The result was too much aldicarb oxime in the aldicarb reactor. Some material had to be removed in order to have the proper proportion of methylene chloride and aldicarb oxime before proceeding with the next step.

The oxidation reactor was selected for temporary storage of the excess aldicarb oxime and methylene chloride solution. To make the aldicarb oxime methylene chloride transfer, copper tubing was installed between the two reactors and the transfer to the oxidation reactor was accomplished early in the morning of August 1.

On August 7, an attempt was made to transfer the aldicarb oxime and methylene chloride in the oxidation reactor back into the aldicarb reactor. The tubing between the two reactors was changed and the transfer was initiated. About 2-1/2 hours after the transfer started, a check indicated that the transfer had finished. The pump pressure had dropped and there was no flow through the pump. It was believed at that time that the material had all been transferred out. The oxidation reactor was thought to be empty from that point until the time of the incident.

The first indication of a problem was a rumbling sound in the unit. An operator in the control room looked out the window at the flare tower and observed some smoking at the flare. Almost immediately after that, the control room was engulfed in a dense white opaque cloud. At 9:26 a.m. an operator turned in the plant gas alarm. By 9:32 a.m. all of the reacting material had been vented. The five operators and one supervisor remained in the control room until the plant emergency squad arrived at 9:33 a.m.

Six employees were sent to area hospitals for observation. Five were released within 24 hours. One employee remained in the hospital for four days due to concern about a pre-existing medical condition. None of these employees have had any recurring effects from their exposure.

In reconstructing the events, the team determined that approximately 4,000 pounds of aldicarb oxime/methylene chloride mixture remained in the oxidation reactor after the August 7 transfer and that steam was entering the jacket of that reactor through leaking steam valves until the incident. As a result, the pressure increased in the oxidation reactor until it forced a safety valve to open, discharging gaseous decomposition products through the emergency vent header into the knockout pot. The flow went through the knockout pot and into the scrubber, with any remaining material flowing to the flare.

This lasted only for a few seconds. The pressure continued to build in the oxidation reactor. The building pressure continued to increase the flow rate out of the safety valve into the emergency vent header until the pressure reached the design setting of the rupture disc on the knockout pot. The rupture disc opened, releasing materials to the atmosphere.

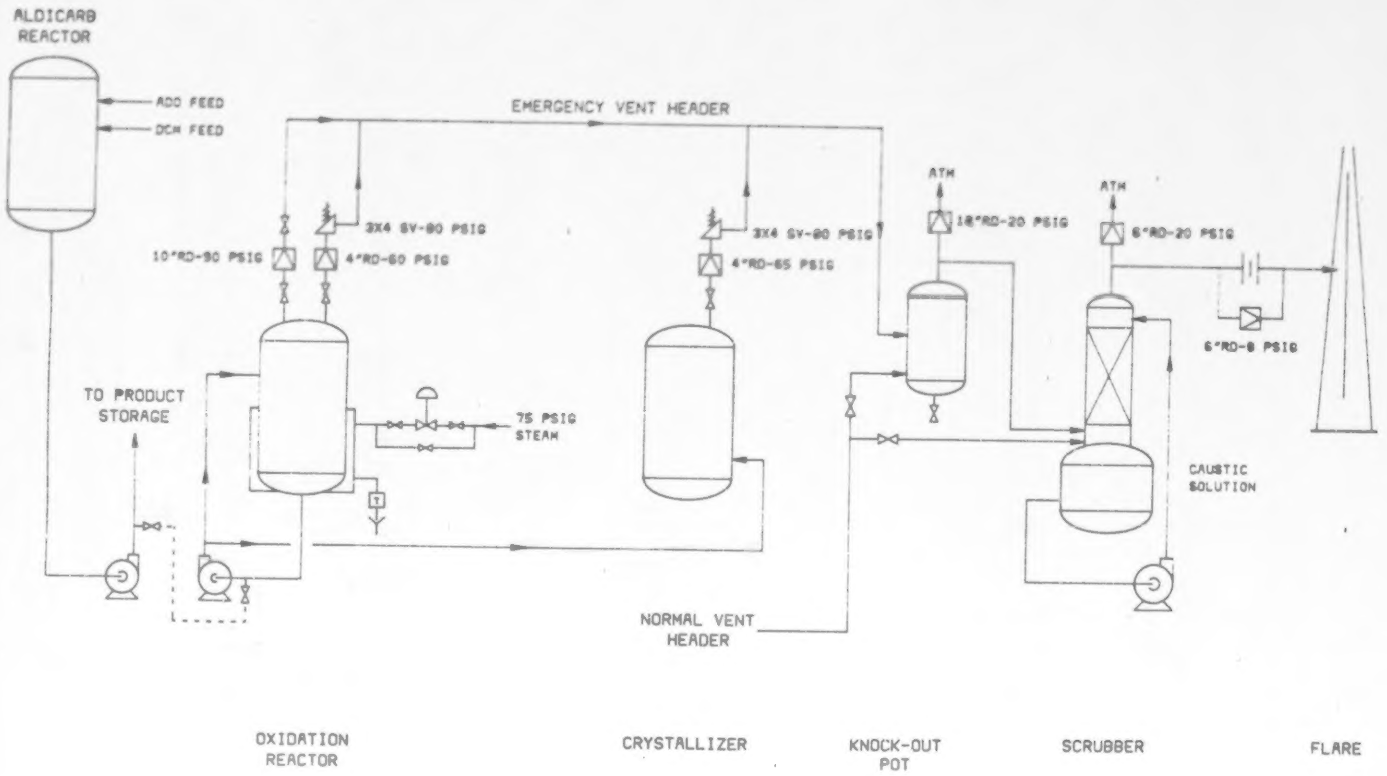
Shortly after that, as the pressure and temperature continued to rise, leakage occurred from three gaskets on top of the oxidation reactor resulting in additional releases to the atmosphere.

From laboratory experiments and computer simulations, we were able to estimate the quantities of material and where they were released. The initial flow that went through the system all the way to the flare is estimated to be 100 to 400 pounds. The releases to the atmosphere from the rupture disc on the knockout pot and from the gasket leaks on top of the reactor totaled 3400 to 3700 pounds.

Approximately 200 pounds of residues remained in the reactor. Those figures add up to the 4,000 pounds in the oxidation reactor just prior to the release.

In technical terms the incident was caused by an exothermic decomposition reaction which initiated at approximately 150 degrees centigrade. The heating was caused by the leakage of steam into the jacket of the oxidation reactor.

That concludes our formal statements. We will be pleased to answer your questions.



ALDICARB REACTOR
ADD FEED
DCM FEED
EMERGENCY VENT HEADER
3X4 SV-80 PSIG
10"RD-90 PSIG
4"RD-60 PSIG
TO PRODUCT STORAGE
75 PSIG STEAM
3X4 SV-80 PSIG
4"RD-65 PSIG
ATM
18"RD-20 PSIG
ATM
6"RD-20 PSIG
6"RD-8 PSIG
CAUSTIC SOLUTION
NORMAL VENT HEADER
OXIDATION REACTOR
CRYSTALLIZER
KNOCK-OUT POT
SCRUBBER
FLARE

Mr. GAYDOS. Thank you very much. Is it proper or reasonable to assume that despite all of the assurances offered by Union Carbide in the past at the prior hearings, even today, and other chemical manufacturers that appeared before this committee, that we will have more accidents of this nature? They are bound to occur, or some of it is going to occur. What is our situation? Will you comment on that?

Mr. BROWNING. Well, we do not accept the premise that they are bound to occur, and we are working very hard to see that they do not. To say that there will be no leaks or no releases of a minor nature is probably beyond the realm of reason, but certainly we think the major releases can be prevented and controlled and the part of this program that I have described this morning, where we are undertaking the expenditure of large sums of money for retraining of people, is designed to do just that.

It is a situation we find ourselves in, very much like the airlines. Airplanes are safe. I take one when I come down here, I'm going back on one this afternoon, but when you have a series of accidents, you have to go back and reexamine your basic premises, and we are doing that in not only our company, but I think many in the chemical industry are.

Mr. GAYDOS. What specific change have you instituted that is going to correct this particular situation? What is your new policy?

Mr. DUPUY. Mr. Chairman, this incident occurred because of a temporary operation. It was not part of the designed routine operation of the unit. This is always a vulnerable time, when you make a change or you do something in a temporary operation.

We have a procedure that——

Mr. GAYDOS. If I may, let me paraphrase. You came up from Woodbine, GA, and I understand there were some complaints down there with MIC, so you bring the operation up here to Institute, and in doing so, you set up this temporary situation where you have the tank, and you have a faulty gage. I think those facts have been verified. You had what you called a temporary holding tank which is not within the normal procedure. I think it is pretty accurate to put it that way.

Now, why would you do that? Is that how loose you were?

Mr. DUPUY. No, let me explain.

Mr. GAYDOS. Go ahead.

Mr. DUPUY. After the tragedy in Bhopal, it was decided not to ship MIC to Woodbine to produce aldicarb, so we converted an existing facility to make aldicarb at Institute. There was nothing temporary about that in its design or construction. It had full instrumentation, and it is a well constructed, designed and operated facility.

The temporary nature that we go into here that I was referring to was an unexpected situation where this material had to be moved out of that design reactor into a vessel for which it was not designed to handle that material.

Mr. GAYDOS. But why? What caused that?

Mr. DUPUY. Well, because of a meter malfunction, there was an overcharge in the aldicarb reactor, and some had to be removed before they could continue with that reactor.

Mr. Gaydos. So they had to make a spontaneous decision there to do something to substitute, right?

Mr. DuPuy. A decision was made to move 10,500 pounds out of temporary storage.

Mr. Gaydos.Which normally is not the case?

Mr. DuPuy. That is normally not the case, and it was in a vessel for which it was not designed, and there were not standard operating procedures to monitor that material as it was in that vessel.

Mr. Gaydos. Was that the thing to do at the time? Given the circumstances, was that the expedient, proper, logical thing to do at the time?

Mr. DuPuy. It had to be moved out of the vessel. Now whether that was the best choice or not for receiving that material, I am not sure. The vessel itself was properly designed to handle this kind of material. The problem was it was not properly prepared for that service, not properly monitored. Now you asked about what changes in procedure have been done.

Mr. Gaydos. Right, what have they done?

Mr. DuPuy. As I said, this temporary nonroutine operation is where this problem really originated, and we have tightened up those procedures significantly and raised the level of approval required in the plant organization before materials can be placed in facilities for which they were not designed originally.

Mr. Gaydos. And that is the basis of one of the citations, isn't it, I mean alleged basis? You are going to appeal those, is that right?

Mr. Browning. We are appealing those, and our counsel has not had an opportunity to really examine and advise us on that, sir.

Mr. Gaydos. What is your established policy inplant: When there is a doubt, don't; or when there is a doubt, depending upon the seriousness of the doubt, don't?

Mr. DuPuy. We have a procedure called the pre startup safety review. I am not sure what you are referring to, but if something is going to be used for the first time, a new unit is started up, or a revision has been made, or if material is moved into another area for which it was not designed, or if a facility has been out of service for a lengthy period of time, the plant procedure calls for a safety review of that decision before it is made. In this case, it did not happen. That review did not take place.

Mr. Gaydos. What constitutes your review? Who is the personnel, the standing committee? Is labor represented on the committee, or is it all management?

Mr. DuPuy. The review varies depending on the magnitude of the project. When this aldicarb operation was brought to Institute, it received a 2-week or more review with five or six technical people, an indepth review.

For the kind of situation that occurred on August 1, when they made this temporary transfer, that would not require that detailed review. A simple review with two or three people for 30 minutes would have found some things to be concerned about in this transfer.

Mr. Gaydos. Let me ask you the $64 question. The escape has occurred. Damages were sustained. Now would you make a statement of record right now that you have put procedures into effect and in place at this time so that you can safely say that this will not occur again?

Mr. BROWNING. This particular unit is not operating, and it is going to be reviewed very thoroughly before it is brought back, and it will be brought back when we do believe that to be the case.

Mr. GAYDOS. And a decision will be made whether or not you feel that it is safe to proceed?

Mr. BROWNING. Yes.

Mr. GAYDOS. And right now, that decision has not been made?

Mr. BROWNING. The unit is not operating, that is correct.

Mr. GAYDOS. Now, what about generally throughout the plant, in other areas which the committee is not cognizant of, maybe other people are not either. Would you categorize or classify your plant generally as being in a safe condition with no specific areas of major concern, or are you evaluating it, continually evaluating it, or are there some operations that you, at this time, may discontinue because of the inability to guarantee safety inhouse and outside?

Mr. DUPUY. Well, we certainly believe that the plant is safe as it is operating today. However, we continually review and audit our operations to see if improvements can be made to make it even safer. We are going through a reevaluation now of all our processes, looking for potential for major releases and also for toxic air emissions.

Mr. GAYDOS. And you are pretty positive you are going to have a safe working plant?

Mr. BROWNING. It will certainly be the most thoroughly reviewed and audited plant in this country when we finish with the Ruckelshaus investigation, our own internal investigation, the work of OSHA that has been described to you and the EPA activity. Yes, we think so.

Mr. GAYDOS. Are you going to have the state-of-the-art equipment and other devices, do you think?

Mr. BROWNING. Well, we do.

Mr. GAYDOS. You do?

Mr. BROWNING. Yes.

Mr. GAYDOS. Counsel suggests it is probably going to be the most inspected plant too in the next couple of years.

Let me ask you, has Union Carbide or anybody, directly or indirectly, done any studies to determine if the substances that leaked and which workers and other people were exposed to will result in a fatal or debilitating disease after a prolonged period of latency, especially since one of the elements of the substance which leaked has been called a carcinogen? Could you address yourself to that problem?

Mr. BROWNING. Yes; there has been a great deal of toxicology work done and some epidemiology work done on the methylene chloride, and it did, as a result of some recent experiments run on rats, I believe, or perhaps mice, an exposure to very high levels indicate some biological effect which has caused some of the governmental agencies to go back and review the standards for those materials.

None of the people in this event were exposed to anything approaching the TLV's or even a significant fraction of them. The epidemiology data on the DCM indicates it is not hazardous to human health over prolonged periods of rather high exposure levels.

There were a number of materials that came out of the tank. People refer to it as aldicarb oxime. It was one of the materials in the tank. Most of the materials that escaped were reaction products of the aldicarb oxime and methylene chloride.

The amount of aldicarb oxime that actually escaped was rather small. We did modelling studies which took into account the direction of the wind, the peculiarity of the materials that were known to have escaped, their density temperature and so forth, and estimated the concentration of these materials at the fence line and also the maximum concentration out in the community, because some of these material would be lofted over a fence line.

It turned out that the maximum exposure would probably ocur in the roughly one-half-mile limit from the release point, and looking at the exposure levels there, we were dealing with very few parts per million, and none of the materials have been shown to be dangerous even for prolonged exposures to the concentrations that we found there which existed for just a very few minutes.

Mr. Gaydos. What about that material data sheet as far as aldicarb is concerned? What does it say on there?

Mr. Browning. Aldicarb oxime.

Mr. Gaydos. How do you pronounce it?

Mr. Browning. Aldicarb oxime. It will say that it is an irritant, no question about that. We have distributed the material data sheets on the materials in the plant to the local libraries and several institutions in the valley. We did that back in April. So that information has been available publicly for quite some time.

Mr. Gaydos. Is it a matter of company policy that workers should be informed of hazardous substances? One of the prior witnesses, and I'm sure you heard him, testified that it's only recently that the material data sheets have been made available and other things, that there is more cooperation. What is the company policy?

Mr. Browning. The company policy is that people should be made aware of the materials that they are being exposed to and what those materials might cause. There is always some question about how that information is transmitted, and material safety data sheets are not secret instruments. These are sheets that we aggressively send to our customers to put them on notice as to how to handle the materials and what exposures they should be guarding their workers against.

Mr. Gaydos. What's the company policy on the long term use of chemicals in the workplace, because you are dealing with a lot of dangerous chemicals? Is it a policy of the company to look for substitute chemicals, or do they try to make the safety and health regulations such that they can handle the chemical? Do you look for substitute chemicals at times?

Mr. Browning. Yes.

Mr. Gaydos. What do you do in that area?

Mr. Browning. To substitute a relatively benign material for one that has rather potent health effects is the direction in which we would always go.

Mr. Gaydos. Have you been doing that, or trying to do it?

Mr. BROWNING. Yes, it is a continuing process. You do not sell things and take the risk unless there is some reason to do that.

Mr. GAYDOS. What kind of an in-house operation do you have as far as toxicity is concerned? How do you evaluate your chemicals? How many people, personnel do you have?

Mr. BROWNING. Well, if I understand the thrust of your question, we have several efforts that would respond to that. We have since the late 1930's been involved toxicological testing of our materials. We established a fellowship at Carnegie-Mellon Institute and still operate that facility jointly with them and under their general supervision or inspection.

We test our materials, subject test animals to what seems to be appropriate, sometimes the skin painting test, sometimes it's an inhalation test, sometimes it's a feeding test, trying to pick the route of which it would enter the human body most likely.

We take action with respect to the data that we get from that animal testing, both in our own plants and with our customers even before the information has gotten to the point where the standards can be set and the regulations set that would require it.

In addition to that, we have a surveillance program of an epidemiological nature, and as a matter of fact, we do this quite often in cooperation with NIOSH principally.

We have a study that's been underway now for a number of years which is moving toward conclusion fairly soon involving all the people who have ever worked in our plants in the Kanawha Valley, and we will be able to go back through their work records and see if there is some disease process that is more prevalent as a result of association with a particular chemical or work in a particular plant, and that data takes a long time to accumulate, but that will be coming out, we hope, pretty soon. We do similar monitoring studies on other chemicals.

Mr. GAYDOS. In comparison to other practices prevalent in the industry, do you think you are on par with them, do you think you are far ahead, or do you think you are behind, as far as this type of activity identifying hazardous materials?

Mr. BROWNING. Certainly in the vanguard there. We also support activities as to other chemical companies, about 30 of us have joined together with the Chemical Institute of Toxicology in Raleigh-Durham, which independently does do testing work and evaluation of pharmacokinetics and the manner in which materials are ingested into the body and how they react with the body, just a lot of research work going on there looking toward new techniques and procedures that would be predictive.

Mr. GAYDOS. In your last incident, there is strong indication of lapses in judgment. One in particular would be the authorization of the warning device, how it was done and how late it came. Could you tell the committee what you have done to change those deficiencies, if anything? Have you made changes?

Mr. BROWNING. I would rather not comment specifically on that particular one for the reasons that you have indicated were appropriate.

I will say that starting after Bhopal, our whole operations were under review, and it is a continuing practice, as Larry has indicated.

Mr. GAYDOS. Let me ask you a final question. The committee is concerned, and I think rightfully so, as to whether we can expect other types of incidents, not only in your particular area of activity, but others in the nation, whether it is chemicals, pseudochemicals or a combination. As an active businessman and participating corporate structure in this type of activity, do you see any salvation? Do you think that we can expect a period of reasonable safety and good health as distinguished from scares and other types of accidents?

What do you think? What do you look forward to? Do you think you are going to be able to cope with this situation down in Institute?

Mr. BROWNING. I do definitely. I have not appreciated the spotlight in which I have found myself in the last few months or the company.

Mr. GAYDOS. You should be used to it from a year or so ago.

Mr. BROWNING. You never do.

Mr. GAYDOS. Of course, you never acclimate to everything, I understand fully.

Mr. BROWNING. You always twitch a little. I think it is not altogether bad that we are looking at a number of incidents which a year ago would not have come to the attention of this committee. I am not complaining about that. I just think that we need to take a look at some of the things that do happen in the normal course of operations.

By examining them, I think we can probably raise our standards of behavior and move toward a lessening of the number of incidents, and perhaps a lessening of their seriousness. So I think the exercise from a societal standpoint has had merit.

Mr. GAYDOS. What about OSHA? Do you resent OSHA as a Government instrumentality causing you big expenditures and irritations and interference with productivity? Is that your concept of OSHA, or do you think OSHA basically is a fundamental sound principle or concept, that it can work and should work, and we need it? How do you feel about OSHA?

Mr. BROWNING. We are very supportive. When I first got into this work, and I have not always done this, they were happier times, I sent a questionnaire to our plant personnel and asked just that kind of a question. Are they a pain in the neck? Should we be working to get rid of them, that kind of thing.

The response was extremely positive. People thought that they did a good job by keeping in the forefront of the public's mind the cognizance, the necessity of doing these things, and also dramatizing to management. You know, it is easy sometimes to want a shortcut, but here were people out there who were keeping everybody's attention focused on this activity.

They had some limitations. We don't do much that I can think of in direct response to an OSHA standard. These are things that we do. We might modify procedures a little bit, but it was not a new way of life for us or for many people in the chemical industry. The operation in which they are embarking, this pilot project they described this morning, does take them into some new areas, and I think it is going to be interesting to see how they can cope with the problems you get into when you really start looking at process design, equipment design. These are a different kind of problems, and you can ask yourself questions. Suppose they had looked at that plant on July 15? What might they have found?

Well, the procedures were in place, things were working smoothly, and the kind of thing that did result in the incident was not there to observe. So there are some limitations that they have and that we have in inspections we can make and the predictions we can make from them. But, no, I think it is a positive force in society, and I very strongly support OSHA.

Mr. GAYDOS. What about Joe Gresham from the union? He had stated before that he thought OSHA was lax, that they were not doing a good job and he thought they didn't come around enough. Do you think he had justification for that observation, because you two seem to get along pretty good. There seems to be a pretty healthy relationship between employer and employee at Institute. But that is his opinion. He says OSHA is not going their job. Is that true?

Mr. BROWNING. Well, he has an opinion, and he does not say—What he really is asking for is more of what he perceives to be a good thing. We are not talking qualitatively about the operation. We are talking quantitatively, and I am not familiar enough with the frequency of inspections and that kind of thing.

An OSHA inspection does not rattle my cage. I do not even have those reported to me unless there is some significant finding, but there are hundreds of those going on in our plants in any given week or month, and they do not come to my attention. So I could not comment on the frequency, but it seems to me that that is the basic thrust that he is making. He wants more of their helpful.

Mr. GAYDOS. Could you place on the record why you are making an appeal to the recent citations?

Mr. BROWNING. Yes, we don't believe that the acts complained of there were willfull or cumulatively do they amount to a level that would justify the willfull.

Mr. GAYDOS. Is there anything else you think the committee should be cognizant of, or do you want to make any statements on the record, either of you?

Mr. BROWNING. No, I would still like to see you come down and take a look at that plant.

Mr. GAYDOS. We will make an attempt to.

Mr. BROWNING. You would get a better feeling for what goes on in a chemical plant.

Mr. GAYDOS. Will you check on all the warning devices before the committee comes down?

Mr. BROWNING. I will do that. I might even come down and go with you.

Mr. GAYDOS. Any questions at this time? I want to thank you gentlemen for taking the time to come down here at your own expense to testify before the committee. Thank you very much. The committee will stand adjourned until the call of the chair.

[Whereupon, at 11:42 a.m., the committee adjourned subject to the call of the Chair.]

○